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News of the Industry Begins Page 828

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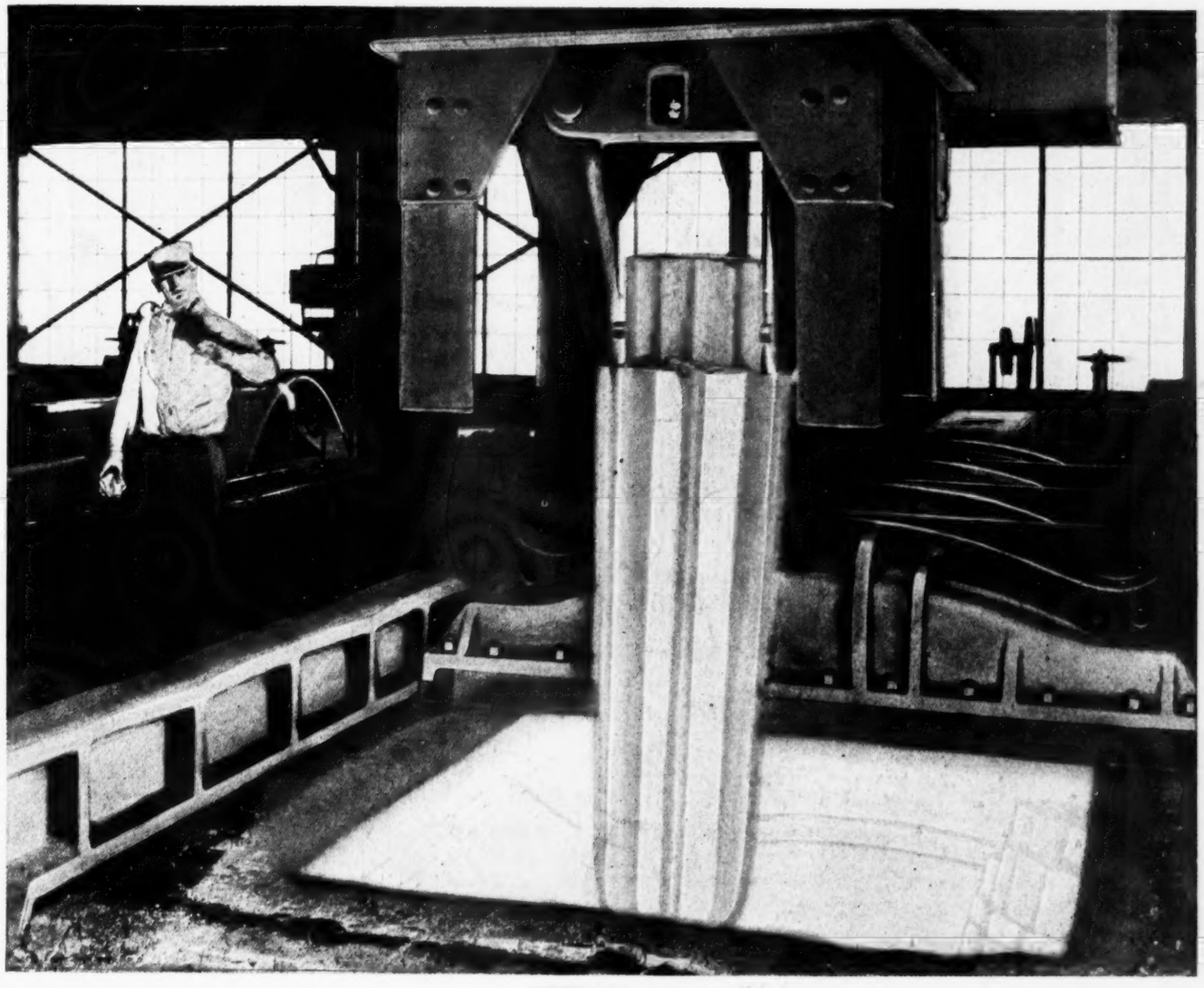

Making Timken steel in the Timken steel mill. An ingot being lowered into the re-heating furnaces.

TIMKEN
Tapered
ROLLER BEARINGS

The quiet and smoothness of Timken-equipped cars and trucks permits them to be most impressively demonstrated. ¶ The presence of Timken Bearings is also fully accepted as an assurance that initial fine performance will last. ¶ Timken advertising has been able to create that universal impression because it is supported by motor vehicles that are bettered by Timken-made steel, Timken Taper, and Timken *POSITIVELY ALIGNED ROLLS.*

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

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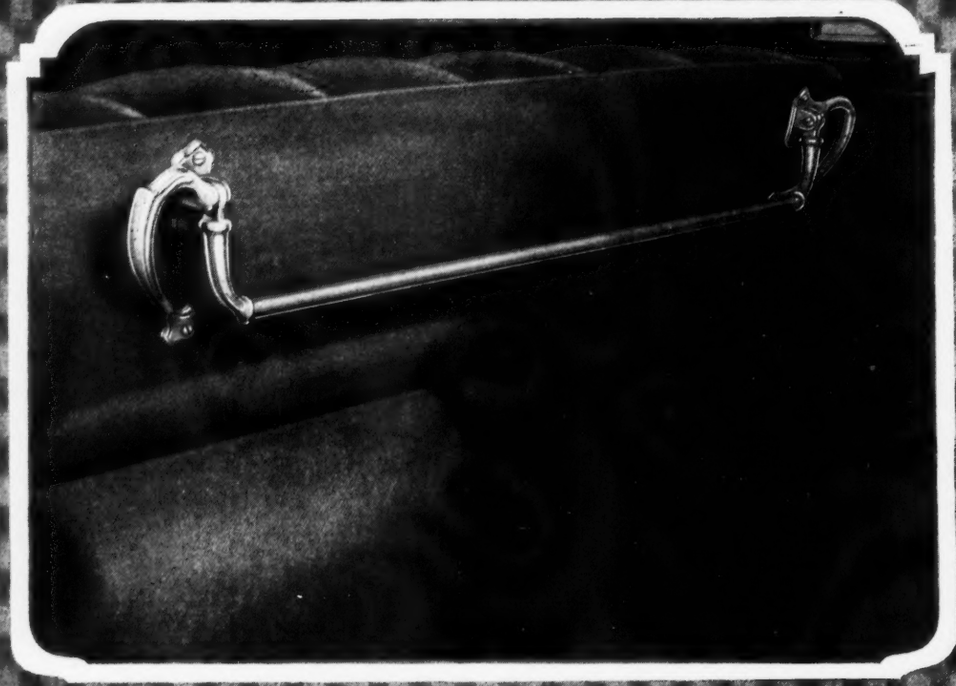
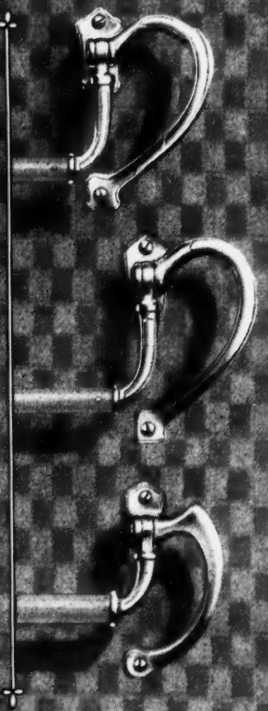


The New Vogue in Robe Rails

Originated by Ternstedt

FOR the first time in automobile history a real advancement has been made in robe rail design and construction . . . the Ternstedt Combination Robe Rail and Assist Grip. ¶ Serving the dual purpose of hand grip and robe rail, it has the added advantage of lending itself to a variety of artistic designs and finishes . . . an ideal blending of utility with beauty. ¶ Its reception by car builder and buyer alike has been immediate and enthusiastic. ¶ Makers of the really fine production cars already have adopted it as standard equipment. ¶ This new product marks still another important contribution by Ternstedt to the refinement and convenience of modern motor car bodies.



TERNSTEDT

Division of Fisher Body Corporation, Manufacturers of Automobile Body Hardware

DETROIT, U. S. A.

AUTOMOTIVE INDUSTRIES

VOLUME 55 *Philadelphia, Thursday, November 11, 1926* NUMBER 20

Retail Truck Sales—*More Cash* and *Less Credit!*

Old policy of "Nothing down and two years to pay" passing. Manufacturers making stand for safer terms.

By Norman G. Shidle

THE cooling breeze of sound terms is beginning to blow rather strongly over the somewhat fevered brow of retail truck financing methods. The presence in the truck sales field of terms extending as high as two to three years, and of down payments running as low as nothing at all, has been generally recognized for several years, although there has not been unanimity of opinion as to the extent of these more hectic forms of retail financing practice.

Some men close to the truck field have indicated a belief that enough of the heavier trucks have been sold on these very long terms and very low down payments to create a serious condition in certain parts of the industry. Others are of the opinion that, even as regards the past, reports of unsound transactions have been somewhat exaggerated.

This last point of view was expressed only a few weeks ago by Edward F. Loomis, secretary of the Motor Truck Committee of the National Automobile Chamber of Commerce.

He reasons that a large percentage of truck sales, amounting to about $600,000,000 a year for the industry, must have been made on a pretty sound basis, because if a majority, or even 25 per cent, were made on a basis whereby the manufacturer lost money, of course the truck industry would crumple up. While present selling methods may be regarded as serious to the welfare and future of the industry, he thinks that there has been a tendency to exaggerate the unfavorable aspects of the matter.

Whatever the proportion of total business done on extremely liberal financing terms in the last five years—and no definite statistical data are available on the subject—both formal and informal events of the last few months indicate that the amount of truck selling done on such terms in the future is going to be less than in the past.

This change in trend seems to have come about through a gradual crystallization of economic tendencies which have been moving steadily in one direction for a long time, rather than as a result of definite moves within the industry, although a few important items of the latter character have been recorded.

The truck manufacturer has a much more direct and important relation to retail financing methods than has the passenger car manufacturer, and the effects of retail financing practices—good or ill—are much more direct in the former than in the latter case. Recogni-

¶ *THE truck branch of the automotive industry—buses of course included—has experienced a gigantic growth in recent years.*

¶ *It has moved ahead so rapidly that it could scarcely expect to escape a few "growing pains." Some of these pains are still in evidence and one of the most acute is rooted in retail financing methods.*

¶ *"Any concession to make a sale" often has been the manufacturer's policy as he felt the grip of competition tighten and fought to keep pace with the expansion.*

¶ *But a change apparently is taking place. Sounder sales terms are beginning to prevail. This article discusses the whys and wherefores of the situation in a broad and general way and sums up present trends and opinions in a manner that will help to clarify what has been for some time past a particularly unsatisfactory phase of automotive merchandising.*

tion of this fundamental is important in talking about the present status of retail financing of truck sales, because of the general tendency to make comparisons with passenger car practices. Such comparisons frequently lead reasons astray because of the many dissimilarities in the two fields.

The manufacturer is financially responsible, directly or indirectly, for a large proportion of the truck paper by which retail sales are financed.

Non-Recourse Financing Unknown

Non-recourse financing is practically unknown in the truck field and either the manufacturer's name or the name of a finance company in which he is more or less financially involved usually is back of the loans made. Local banks do finance a certain number of transactions for truck dealers, to be sure, but even in such cases the name of the manufacturer as well as that of the dealer often is required on the notes. Moreover, a very large number of retail truck sales are made through direct branches.

Thus, it becomes apparent, the financial responsibility in truck sales financing is pretty largely centralized in the truck manufacturer. If methods are sound and credits held to safe limits, there is, naturally, no particular danger in this fact. The ill effects of unsound and unsafe terms on the other hand will be reflected much more directly and quickly in the manufacturer's balance sheet than in the case of the passenger car maker. In the latter case, unsound terms may put out of business a number of individual dealers before the manufacturer gets a direct reaction from the unsafe practices; and it is not likely that all of the dealers for a single concern will go wrong at the same time in the same way. The car maker always has notice of the fire before it can attack his own financial structure.

The relative centralization of financial responsibility, then, is one of the chief basic considerations to be recognized in dealing with the question of retail financing of motor truck sales.

This single fact may perhaps account for the extremely large mortality in truck manufacturing organizations; a mortality which, over a period of years, probably has been considerably greater in proportion than that among passenger car makers.

It must be recognized also that terms which might be practicable and profitable from the standpoint of one manufacturer might be ruinous from the standpoint of another.

But even considering these factors, it is readily apparent that certain principles of sound credit will apply in every instance and that these principles have been violated many times in the past.

It is hardly necessary at this late date to spend much time in rehearsing the chief difficulties which have cropped up in the truck selling and financing field. A few of the more important items will bear brief discussion, however, in the light of current announcements and informal determinations to hold terms and down payments to a more conservative basis in the future.

The real trouble, according to several particularly well informed truck executives, lies in the fact that too many trucks have been sold to irresponsible operators. These executives define irresponsible operators as men who couldn't pay for the trucks in the beginning, who were incapable of operating them at a profit and who, consequently, provide, during the time that they have the trucks, competition which is ruinous to the established and stable hauler.

Such sales are absurd on the face, these executives believe, since they obviously tend to put out of business the profit-making hauler who after all is the best truck prospect available. In other words, this group claims, truck manufacturers in many cases have helped to put some of their best customers out of business.

But how is the manufacturer selling a truck to be able to predetermine the financial and business responsibility of a given prospect?

Many cases are on record where a man has bought trucks with practically no down payment and has been able, through hard work, intelligent operation and sound business ability to make those trucks pay profits consistently over a long period of time. As a result he has paid for the trucks in full and has made a good living for himself.

If that same man, it may be argued, had lacked the business ability which he had, he would have failed in his payments and would have been an unprofitable customer. How can that be determined beforehand?

The answer to that argument given by another important manufacturer is simple. It runs about like this: If the truck manufacturer always makes certain that he has sufficient equity in the truck to make possible repossession at a profit at any given time, he need not try to prejudge the business ability of his prospect. The only men or the only companies which should be permitted to buy trucks without a substantial down payment are those whose financial rating is so good as to indicate that they readily could pay the full list price in cash if necessary.

In other words, complete and careful credit investigation and the application of those sound credit principles which are needed in every business are essential in truck retail selling.

Failure to apply these principles must sooner or later result in financial grief for the manufacturer extending the credits.

In the opinion of many truck executives, the current trend toward sounder terms is primarily the result of unfavorable experience with extremely long terms and low down payments. Economic laws, they contend, simply have been operating steadily as usual and finally have made it plain to manufacturers that over-indulgence in credit laxities is thoroughly unprofitable as a long swing proposition.

Evil Effects Becoming Evident

No new factors have entered the situation, it is contended; rather the effects of past practices are merely becoming more fully evident. Both truck manufacturers and the banks which supply them with funds are more keenly alive to the necessity for rigid credit activities than ever before and the results are beginning to be felt in actual retail selling practice. It is becoming generally recognized that sale of trucks to "shoestring" operators is almost certain to be unprofitable unless the manufacturer retains sufficient equity in the vehicle to make it possible for him to repossess profitably at any time. And the tendency to operate on this basis is gradually becoming more general.

Officials of one of the large companies which have been tightening up somewhat on long time sales also declare that various truck owners' organizations, which might be expected to resent any curtailment of liberal terms or increase in down payments, have, on the contrary, expressed their approval of this policy. Their attitude is that more stringent terms will eliminate much of the illegitimate and fly-by-night competition from which they now suffer.

One possible alternative to selling trucks on time in

the usual way is for the truck manufacturer to operate truck renting organizations.

This method is already being tried with success by at least one important producer in two cities and further extension of the idea seems not unlikely. In this case the truck manufacturer, through an operating company in which he has at least a controlling interest, may sell the transportation which is in his trucks on a weekly basis, thus obtaining, not only a profit from the operations themselves, but also a sound market for many of the vehicles which he produces if his operating activities become reasonably wide as time goes on. He need not even form entirely new companies in going into the operating field; he may instead simply buy up hauling companies already established and operate the trucks which those companies already own, replacing them with his own make as they wear out.

Inflated List Prices

The so-called inflated list price is another of the more important bones of contention in truck selling which has a direct bearing on the question of retail financing. Some manufacturers, it is charged, list their vehicles at a price several hundred dollars higher than that at which they expect actually to sell them. This inflation then is used in making allowances on used trucks turned in in connection with the purchase of the new vehicle, thus making it possible to give the purchaser a very large allowance on his old vehicle and at the same time permit the manufacturer to realize his desired fair profit on the sale of the new one.

From the standpoint of purely theoretical economics, inflation of a list price on this basis is thoroughly unsound. Such inflation tends year after year to give truck buyers an entirely erroneous idea of the real value of their used vehicles and tends to make more and more difficult the task of getting trade-ins handled on a rational and correct basis.

In this respect the truck and passenger car fields can be compared with more or less propriety and it is clear experience of the passenger car industry that the difficulty of the used car problem has diminished almost directly in proportion to the ability of the industry to establish in the minds of the public the real economic value of used cars. A certain amount of this inflation for trade-in purposes probably still exists in the passenger car field, but it has been eliminated to so great an extent as to be a minor rather than a major factor.

The argument in favor of the inflated list is well known and doubtless has some merit from the standpoint of temporary and current merchandising considerations. The average buyer, it is argued, likes to think that he is getting a discount or a particularly good deal when he buys anything. True, the rival salesman may point out to him that if he gets a huge allowance on the Whatnot truck that the Whatnot company must simply have added something to the list price to take care of that allowance and that he isn't really getting anything for nothing. But, it is claimed, and probably with truth, that the average buyer is hard to convince of that fact and sticks for a long while to the idea that he might be getting something for nothing after all.

Thus while there are strong evidences of curtailment in the practice of selling trucks to irresponsible operators, it can hardly be said with any assurance that the so-called inflated list price is going to be a thing of the past in the near future.

Perhaps the most important move of recent months as regards truck financing methods is that which was made a few weeks ago by Mack Trucks, Inc.

The Mack company has decided, after long investigation and thorough analysis, that no truck is to be sold on the instalment plan with a down payment of less than 20 per cent of the purchase price in cash, or more than 18 months to pay the balance, unless the business status and credit rating of the purchaser is such as to make the risk obviously safe. In many instances, Mack now requires a 25 per cent down payment.

Perhaps the most important feature of the new policy is that the trade-in allowance on an old truck shall not be considered as a part of the cash down payment, and this means that an inflexible rule is to be followed out in all transactions that there shall be a substantial down payment in cash with no alternative.

The result of the immediate application of this policy is expected to have a temporarily adverse effect on the earnings of the company, but officials are apparently resigned to this in view of the larger prospect of establishing all of its future business on a sound and sane basis.

There are indications that a number of other important producers are taking this same constructive and long swing view of the retail financing situation and that the truck industry as a whole is nearer ready than ever before to pass up possible chances for temporary competitive advantage in the desire to build firmly for a stable future.

And the ultimate possible effects of retail financing practices are becoming more clear as time goes on. It may be pointed out that the placing of trucks in the hands of inexperienced operators handicapped by lack of capital tends to create competitive conditions which really harm the public in the long run and that anything which tends to harm the public, sooner or later is likely to become involved in the discussions of regulation. So far as there is any demand for truck regulation from shippers at the present time, it probably springs indirectly from this very thing.

Throughout this whole movement toward sounder methods of financing motor truck retail sales, it seems likely that the gradual working of economic law and the intelligent application of methods proved sound by past experience will be the dominating factors in the desired improvement of the situation.

Agreements Hard to Enforce

It has often been said in the truck business, "If every manufacturer would only do this or do that," the conditions would be made perfect. Past experience indicates, however, that attempts at rigid agreements, enforcements of agreements and so forth almost always have ended in failure. Passenger car financing terms finally were brought within reason through the sure processes of education, publicity, experimentation and analysis of experiences after an initial attempt to enforce an agreement regarding adherence to given terms had failed ignominiously.

Every manufacturer in a given situation is almost certain to pursue practices which seem immediately necessary to his own salvation regardless of the possible effects in the distant future; sometimes what might appear to be unsound methods may be necessary temporarily in a given case if there is to be any future at all for the particular company. And unenforced agreements usually create ill-will and disappointments which might have been avoided had no attempt at such rigidity been attempted.

But detailed and frank discussion of problems seems likely to clarify the situation considerably.

The truck industry is on its way up from a standpoint of marketing methods today.

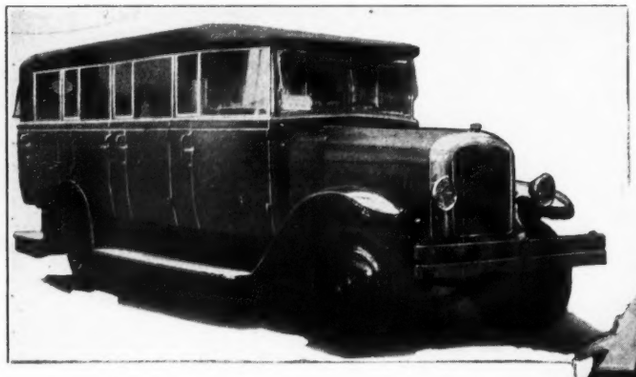
Fabric Leather Bus Bodies Latest European Innovation

Introduced by several manufacturers at Paris Truck Show. Six makes of American commercial vehicles displayed. Most foreign jobs now have servo brake mechanisms.

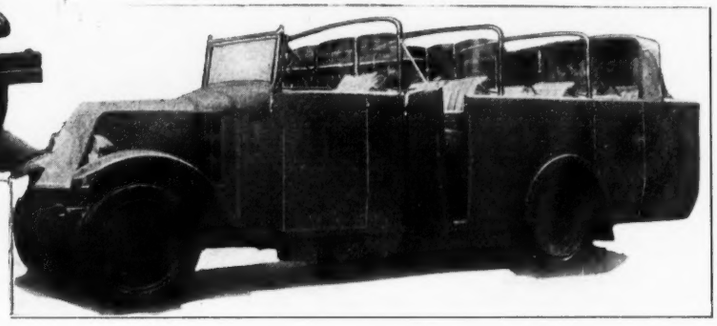
By W. F. Bradley

AN increase in the number of suction gas producer plants, drop frame chassis for buses, an extended use of front wheel brakes with servo mechanism, and the introduction of fabric leather bus bodies—these were the outstanding features of the 1926 Paris Truck and Bus Show which opened at the Grand Palais one week after the closing of the passenger car salon.

All of the French builders of commercial vehicles, as well as six from the United States, three from Italy and one from Belgium, exhibited their wares. Automotive accessories and wireless apparatus were also displayed.



ABOVE: *Saurer coach with fabric leather body*



BELOW: *Fabric leather coach on Renault chassis. Built for French Line Steamship Co., for service in Algeria*

The American exhibitors were Ford and Fordson, Graham Brothers and Dodge, Studebaker, Pierce-Arrow, Chevrolet and General Motors. The Studebaker corporation exhibited a 20-passenger single-deck coach built at The Hague by Koetswerk, on a big six chassis, which had been sent to Paris by road prior to going into service in Holland.

With gasoline costs rising and uncertainty regarding liquid fuel supplies, every encouragement is being given to the use of substitute home fuels, and all the technical difficulties connected with suction gas producer plants having been overcome, the demand for them is now strong among truck users. Government encouragement is being given to this move by a reduction of 50 per cent in the tax when gas producer plants are used in place of gasoline.

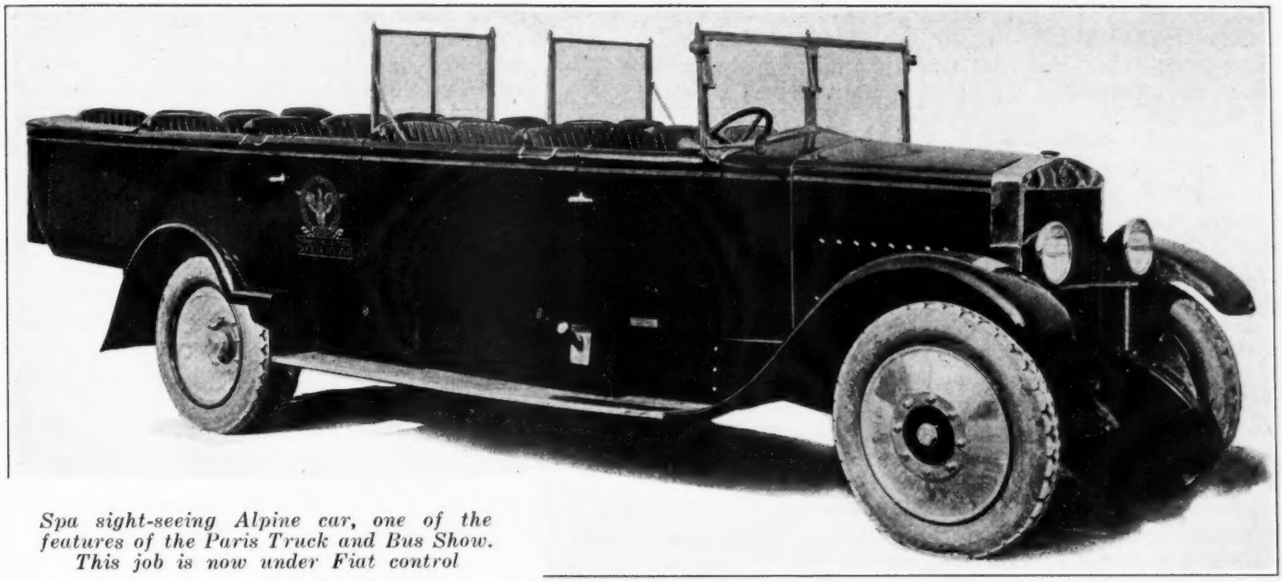
The truck makers showing most activity in this field are Panhard-Levassor, Berliet, Saurer and Renault in France, and Pipe of Belgium. The fuel used is wood, charcoal, or specially prepared bricks made of charcoal.

The loss in power due to the use of charcoal gas, as compared with gasoline, is about 30 per cent, but this can be regained by fitting an engine of greater displacement and by employing a higher compression ratio. A ratio of 6 to 1 appears very general for charcoal gas engines. Panhard-Levassor, for instance, uses a sleeve valve engine of 305 cu. in., having a compression ratio of 6, whereas for the same load on gasoline an engine of 190 cu. in. is used, having a compression ratio of less than 5.

A new low-loading bus chassis is presented by Saurer. It has the firm's standard L-head engine of 110 by 180 mm. bore and stroke, and is special only in the frame members, the front axle and the rear axle, this latter being of the double reduction type with spur gear drive in the rear wheel hubs. The height of the platform is 24½ in. above the ground.

A second Saurer chassis is an entirely new model, having a four-cylinder 90 by 150 mm. overhead valve engine and shaft drive with a single reduction rear axle. The use of overhead valves is a departure from Saurer's usual practice, but the other features of the chassis follow the general design of the firm.

Produced jointly by the Scemia and the Renault companies is a low load bus chassis, designed to carry 40 passengers and having been adopted for service in Paris. The feature of this is the low platform, which is only 14½ in. from the ground, with the main portion of the body 24 in. high, and the use of a special double



Spa sight-seeing Alpine car, one of the features of the Paris Truck and Bus Show. This job is now under Fiat control

reduction rear axle having a bevel pinion drive, with a second reduction by means of spur pinions. (A full description of this chassis will be published in an early issue.—Editor.)

An unusual type of final gear reduction is one shown by Delahaye on a 5-ton truck chassis. The propeller shaft carries a spur pinion engaging with a ring gear on a secondary shaft immediately below it. This secondary shaft has two bevel drive pinions, each one engaging with a crown wheel on a differential shaft. The design allows a certain amount of canting of the road wheels.

Citroen One-Ton Chassis

Citroen is producing a one-ton chassis having the same engine as his new passenger car, the same transmission, with heavier and longer frame members, stronger springs and a heavier rear axle. The elements produced in his Budd plant for passenger car bodies are made use of for all-metal hotel omnibus and express delivery bodies. These are the only all-metal commercial bodies produced in France.

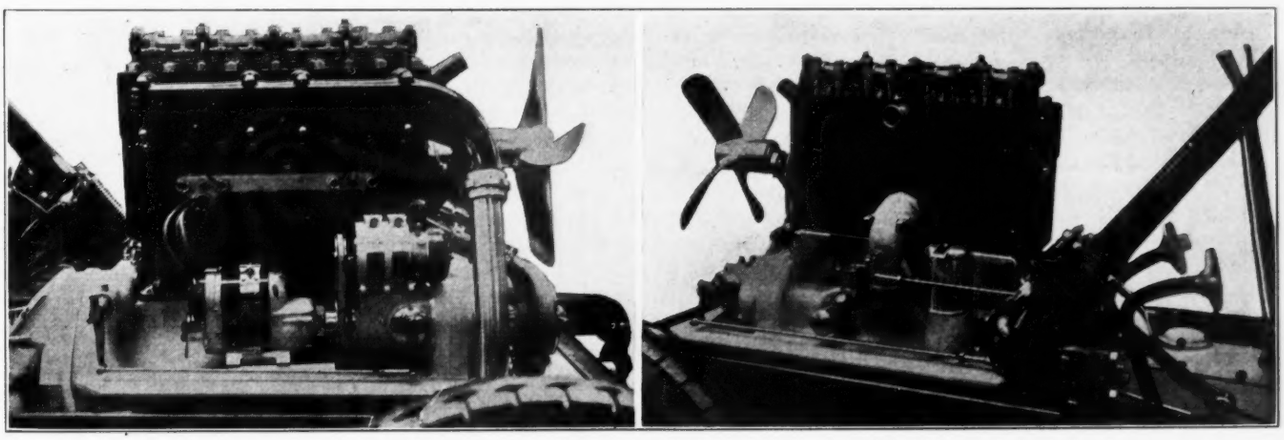
Short-wheelbase, pneumatic-tired tractors, hauling trailers and semi-trailers, are shown by Renault, Chenard & Walcker and Latil. The last mentioned has a coupling consisting of a ball head on the trailer received in a socket on the tractor. The stem of the ball head pivots on two points, and advantage is taken of this to automatically apply the brakes whenever the trailer tends to overrun the tractor.

The only six-wheeler in the show is one produced by Renault for passenger service in the Sahara desert. The body, which is entirely special for this class of work, carries eight seats, divided into two rows by a central gangway and capable of being transformed into four lower and four upper sleeping berths. The coach has a single front entrance, central gangway and lavatories at the rear.

Four-wheel brakes are now found on practically every commercial chassis, the general practice being similar to that of passenger cars, with the addition, on many of the coach chassis, of a separately operated transmission brake.

Vacuum servo brakes, of either the Dewandre-Repusseau or the Westinghouse type, are used on at least 60 per cent of the vehicles in the show. Pneumatic tires have made enormous progress on all commercial vehicles up to 5 tons useful load. Speaking generally, pneumatics are used exclusively for useful loads up to 3 tons and are offered as alternative equipment up to 5 tons.

Spa, which now constitutes the truck section of the Fiat company, is specializing on 3 and 5-ton chassis with an engine common to the two. This is a four-



LEFT: *Carburetor side of the new Saurer 2-ton truck engine.* RIGHT: *Saurer 2-ton truck engine viewed from exhaust side*

cylinder 100 by 140 mm. detachable L-head engine of conventional design, having the clutch and transmission in one unit with it and final drive by a double reduction rear axle. The 5-ton chassis is similar in design, but of heavier construction.

By reason of this combination, Fiat's activities appear to be limited to light, high speed commercial vehicles embodying practically the same parts as the firm's passenger cars. The 9 hp. four-cylinder model 509 is now marketed as an express van.

Although some of the leading French firms are preparing to produce electrics, the only one in the show is a new model built by Panhard-Levassor in conjunction with the Oerlikon company. Its outstanding feature is the direct mounting of the electric motor behind the differential housing of the rear axle, with drive by means of spiral bevel gears. The chassis, which has a useful load capacity of 1½ tons, has its two battery boxes hung centrally in the frame, with a hoisting mechanism for raising and lowering them into position. When dropped, they pass under the frame members and are fitted with rollers to allow them being pulled away.

A new method of heating the air inlet to the carburetor is used on the Panhard-Levassor gasoline trucks. A tube extending along the top of the exhaust manifold is carried around the cylinder block to the carburetor on the opposite side of the engine. Six small diameter tubes with open ends extend vertically through the exhaust manifold and open into the air pipe.

Fabric leather has made its appearance for motor coach bodies. The Cottin & Desgouttes Company exhibited a Weymann hotel bus, carrying 12 passengers and having two doors at each side, one being forward, by the side of the driver, the other at the rear, behind the axle. So far as general construction is concerned, this did not differ in any respect from Weymann bodies for private passenger service.

Another Weymann produced by Laffly, on a high speed 20-passenger coach, had deep sides, inclosing the running-boards, except just ahead of the first of the three doors on each side. The body was conspicuous by reason of an entire absence of molding and by having square corners.

In addition to these two built under Weymann patents, several other coach bodies were shown with fabric leather covering. Among them was one built by Breteau for the French Line Steamship Company's sightseeing services in Algeria. Deep sided, with the running-boards enclosed and having a step opening with the door, the 12-passenger body had the same grey fabric leather covering for the inside as for the outside. A very big capacity baggage compartment was built in the rear end, and below this was a locker for two spare wheels. Being intended for long distance work, provision was made for hauling a trailer.

The type of top fitted on this coach is one popular among builders of this class of vehicle. It consists of a very short single bow folding top, to the forward edge of which a canvas cover is attached by pressure buttons, the canvas being supported by three hoops, uniting the windshield supports and fastening at the front to the top of the frame of the front windshield. Very light and providing sufficient protection against rain, this type of top has the advantage of being removed or put into position by one man in two or three minutes' time. Half a dozen other fabric leather bodies by various makers indicated that this type of covering must now be considered a direct rival of metal for coach and bus service.

A new short wheelbase farm tractor, with a four-cylinder 3 by 4⅜ in. engine was shown by Renault.

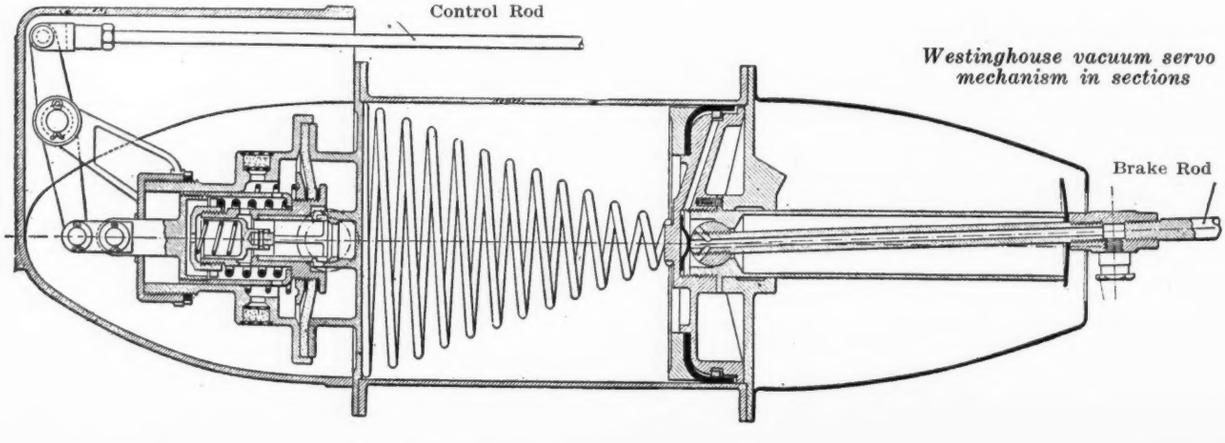
French Westinghouse Servo

THE French Westinghouse Co. at the recent Paris Automobile Show exhibited a servo mechanism for automobile brakes of which brief descriptions were given in French automobile papers. The following information concerning this device and the accompanying illustration is taken from *La Vie Automobile.*

The servo consists essentially of two parts, a distributor (valve gear) and a brake cylinder. Within the valve housing there is a diaphragm chamber containing a diaphragm which is acted upon in one direction by the vacuum created by the engine and in the other by the control rod. The vacuum evidently pulls the diaphragm toward the right in the sectional view, while by means of the control rod acting through a coiled spring, it is pulled toward the left. When in any given position of rest the two forces acting upon the diaphragm are in equilibrium.

The description given of the device is not complete, but it appears that the brake cylinder is arranged to communicate with both the inlet manifold and the atmosphere, and that as the diaphragm is moved toward the left by pressure on the brake pedal, the communication with the inlet manifold is widened and that with the atmosphere gradually cut off. It is claimed that the force of brake application is at all times proportional to the pressure exerted on the brake pedal.

Within the brake cylinder is a piston of the leather cup type, which is guided by means of a hollow piston rod. Inside of this hollow piston rod there is a pullrod having a universal connection with the piston, which pullrod at its other end connects to the regular brake linkage.



Westinghouse vacuum servo mechanism in sections

Just Among Ourselves

Competition Keeping Factories on Toes

THE stiffness of competition in the passenger car field, despite a year of unusually high production, is evidenced by the immense amount of activity in designing almost entirely new models which has been going on in the various factories in recent months. And the competition today is not only one of methods, selling power, and productive efficiency —it is largely a battle of ideas. It is safe to say that there isn't a manufacturer in the industry who feels that he can sit back and coast along to future success merely on the basis of what he already has done. An almost frantic search for new ideas in design, in sales methods, in every phase of automotive management, crops up here and there as one goes about through the industry. "The fellow with the best ideas is going to win; we've got to keep on generating new, workable ideas or the procession will catch up with us and pass us." That's more or less the attitude of mind of even some of the more prominent and successful manufacturers. There isn't much chance that the automobile industry will become complacent and self-satisfied. Competition is too keen and too many new ideas are being generated every week.

* * *

Many New Models Still to Come

THE crop of entirely new models to be announced between now and New York Show time seems likely at present writing to number anywhere from five to 10, a not inconsiderable total in view of the number of passenger car companies now in existence. There will be in addition, of course, the usual large number of revisions of 1926 models, changed body lines, incorporations of new equipment items, etc., on practically every line. Four-cylinder models seem to be entirely missing from the list of proposed new cars now in preparation. Sixes and eights hold the stage with sixes predominating. With eight eight-cylinder cars, however, already selling for less than $2000, there are indications that some other makers may enter this same competitive field before another six months have passed.

* * *

Minimum Speed Limit Idea is Spreading

THE minimum speed limit idea is gaining headway every year. Just the other day we heard of a woman driver who was threatened with arrest for ambling along at about 20 m.p.h. in the left hand traffic lane of a four-lane portion of the Lincoln Highway. For several years past, state police have made it a part of their duty, in handling the gigantic traffic to and from big football games, to see that individual drivers kept going at a reasonable pace at all times so that a maximum number of vehicles could be got past a given point in any given time.

* * *

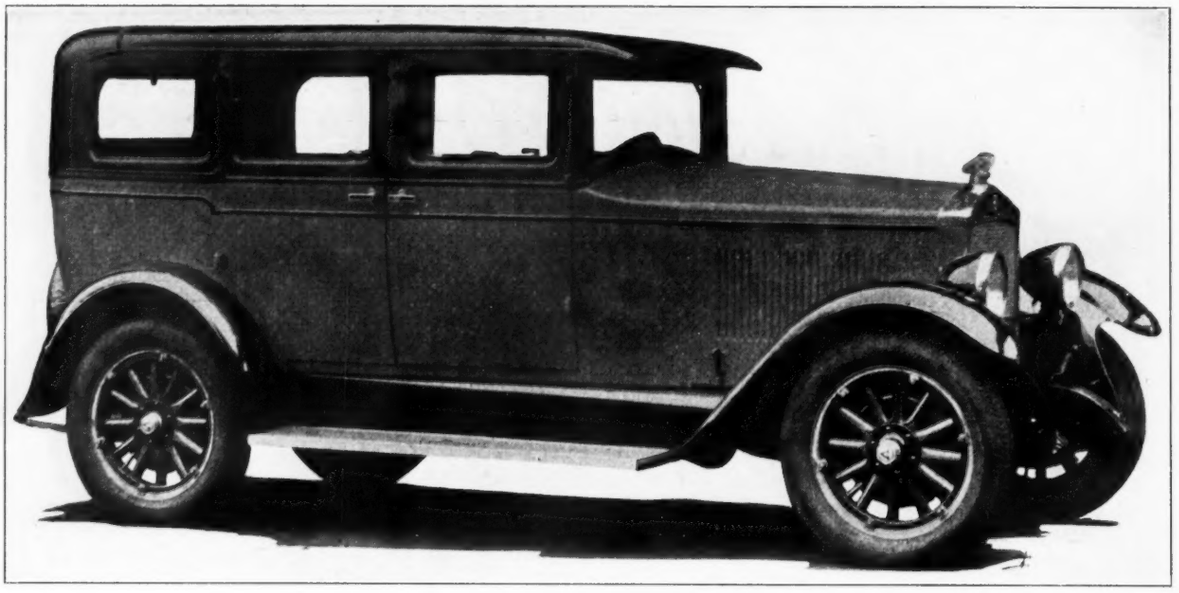
Connecticut Sells Idea by Direct-Mail

THIS year the State of Connecticut sent to all purchasers of tickets to the Army-Yale game a printed card signed by the State Police Department, the Motor Vehicle Department and the Highway Department. This card, in the most courteous language possible, requested that motorists avoid extremes of speed on main highways but that they refrain from traveling so slowly as to hold up the traffic behind. "It is our experience," the card reads, "that the college football fan is the most considerate and careful of drivers. The State Police Department is pleased to report that last year its officers were not required to make a single arrest for violations of the motor vehicle laws on football days. Neither was there a single serious accident." This is followed by the admonition "Let's repeat this year." Plenty of other instances can be piled up from recent experience where traffic law enforcement officers are taking a constructive and progressive attitude as regards handling of automobile traffic which is many years in advance of the obsolete and outworn local laws or ordinances applying to vehicle speeds which still exist in many towns throughout the country.

* * *

Signs Meant Nothing to This Traffic Cop

ONE particularly striking instance of this difference between the attitude of the traffic officer and the existing law occurred recently in South Langhorne, Pa., where a speed trap has been in operation for some time and where wise motorists usually are extremely cautious of their operating speeds. The speed limit is 15 m.p.h., a fact of which the motorist is informed in no uncertain manner by signs every 10 or 15 feet. A traffic officer often is stationed at the main crossroads in the town. To one timid soul who was running at 15 m.p.h. the other day, he gave an extremely dirty look and motioned to step on the gas. The m.p.h. which actually constitute a speed limit on a given highway, moreover, vary often in accordance with the time of day or day of the week. A motorist who was stopped on Sunday afternoon on the Lincoln Highway recently was informed by the traffic officer that the speed limit was 30 m.p.h. and that "on Sundays we try to see that drivers hold down to that limit." What's a fellow going to do?—N. G. S.



Velie Model 50 four-door sedan

Velie Enters Low-Price Six Field With New *Model 50*

Four-door sedan on 112 in. wheelbase chassis lists at $1045. Engine of 196 cu. in. displacement develops 46 hp. Car speed of 60 m. p. h. claimed. Four-wheel hydraulic brakes are fitted.

A NEW and lighter six-cylinder model known as the 50, with a wheelbase of 112 in., an overhead valve engine and force-feed lubrication to all bearings except those of the piston pins, has been announced by the Velie Motors Corp., Moline, Ill. Only one body style is mentioned in the initial announcement—a four-door sedan listing at $1045. Four-wheel Lockheed hydraulic brakes are standard equipment.

With a displacement of 196 cu. in., the engine develops 46 hp. at 2600 r.p.m. and a maximum car speed of 60 m.p.h. is claimed. From the sump oil is carried up to the hollow rocker arm shaft on top of the cylinder head. From holes in the wall of this hollow shaft, streams of oil of the size of a lead pencil shoot continually at the ball and socket bearings at the top ends of the pushrods.

Cast-iron pistons are used, and are fitted with three 1/8-in. rings above the piston pin, the lowest of these being a Perfect Circle oil control ring. In addition to these three there is a fourth ring near the bottom of the skirt. This ring, which is 3/16 in. wide, is designed to prevent side slap and to equalize cylinder wall wear. Holes are drilled through the cylinder wall back of this ring. A vibration damper is fitted to insure smooth engine operation at all speeds.

In order to eliminate trouble from condensation of moisture in the crankcase, the oil pump, instead of being located at the lowest point of the sump, is placed some distance above it. Occasional draining by removing a plug in the sump underneath the pump will remove the water.

Crankcase ventilation is provided for by incorporating the air pipe with the valve housing cover and drilling a small hole in the wall of the pipe toward the valve housing. The valve housing communicates directly with the crankcase, and through this hole any vapors that form or get into the crankcase from the cylinder are drawn off and fed back to the cylinders.

A number of design features in the engine contribute to quietness of car operation. Among these are the Textolite gear on the camshaft and pressure lubrication of the valve mechanism previously mentioned. The crankshaft, which is statically and dynamically balanced, is carried on four bearings of 2 1/8 in. diameter. The front bearing is 2 1/4 in. long, the center bearings 1 1/2 in., and the rear bearing 2 5/8 in. The crankpin bearing size is 2 by 1 5/8 in.

Cylinders are cast in a unit with the upper part of the crankcase. Valves have a lift of 5/16 in. and a clear diameter of 1 5/16 in. A Stromberg Model OH-1 horizontal 1 in. carburetor is used, together with a Stewart vacuum tank drawing fuel from a 17-gal. tank at the rear of the car.

Electrical units, including ignition, starter and generator, are Auto-Lite, while the battery is a Prest-O-Lite of 90 amp. hr. capacity.

A Warner transmission, Borg & Beck clutch and Ross cam-and-lever type steering gear are other chassis units embodied in the model 50. The transmission ratios are 3.07 to 1 in low, 1.77 to 1 in second and 1 to 1 in high gear. In reverse the ratio is 4 to 1. The transmission holds one quart of oil.

In this issue—

Bourdon Describes the New Features in British Design

M. W. Bourdon

BRITISH design trends, as revealed by a study of the new models exhibited this year at Olympia, are discussed in this issue (page 814) by M. W. Bourdon, special editorial representative of *Automotive Industries* in England.

Mr. Bourdon is recognized as one of the foremost technical automotive journalists in England and his articles in *Automotive Industries* on British developments have been regarded for many years as the most timely and informative of their kind published in America. He has been closely associated with the industry in his native country for 26 years. After serving his time in cycle and general engineering, he entered the motor business by starting a garage and repair shop in 1906. Later he became associated with the introduction of the first six-cylinder (Napier) car and in 1906 joined H. Kerr Thomas in producing the first Hallford trucks and Tilling-Stevens gas-electric buses.

As early as 1900 he had begun to write on automobile matters and by 1909 had established himself as one of the best-known authorities in his field in England. By this time he had decided to devote himself entirely to journalism and therefore when the opportunity came to join *The Autocar* as assistant editor he accepted. In 1918 he was made joint editor. In 1919 he resigned to become a "free lance" and was appointed British correspondent for *Automotive Industries*. Always giving the latter the first call on his services he yet finds time to continue as a regular contributor to many British newspapers and journals, to write instruction books for motor manufacturers, handbooks for publishers and technical announcements for manufacturers, and to contribute technical editorials and articles to British automotive journals dealing with passenger cars, trucks, tractors and motorcycles.

Motors and motoring being his hobby as well as his work, most of his spare time he confesses is spent in his garage and private workshop.

The bodies, the same as the great majority of the chassis parts, are made in the Velie plant. The body is of composite construction, and ample leg room is provided. All windows can be opened, even the quarter windows at the sides of the rear seats, Dura spring-compensated regulators being fitted. The same type of regulator is provided for the windshield, which opens vertically.

The visor is of the built-in type, being in effect an extension of the roof and covered with roof material. Other external features are the radiator design with its vertical bar effect built into the core, the body and hood lines with kick-up in the bead back of the rear door, and the door handles equipped with American-Swiss Magneto type locks with inside control.

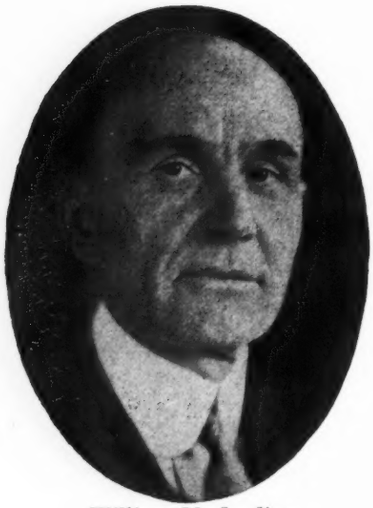
The finish is Duco. The lower part of the body and the hood below the upper molding, including the crest panel and the top of the hood, are finished in pigeon gray while the part of the body above the upper molding is in Buckingham gray. Striping is cream and molding raven black. The interior is finished in fabric in a color tone to harmonize with the pigeon and Buckingham grays used on the body.

The instrument panel is of wood and is metal-covered and finished in natural walnut. It contains the speedometer, oil gage, ammeter and engine temperature indicator and is illuminated by a shielded light. Other features of the body include a cowl ventilator, recessed type pockets in the rear doors and pockets on both sides of the cowl panels, curtain on rear window to match upholstery, dome light, automatic windshield wiper, rear vision mirror and robe rail. Four scuff plates also are included.

THE Timken Engineering Journal, a loose-leaf book of 110 pages and containing technical information relative to the application of Timken bearings to automotive and industrial machinery, has been published by the Timken Roller Bearing Co. of Canton, Ohio. A number of pages are devoted to the explanation of the Timken bearing as manufactured at the present time. Typical problems involving the calculation of bearing loads and the selection of suitable bearings are given and worked out. Tables showing ratings, capacities and dimensions, as well as speed-capacity curves, are included.

Methods of mounting, shaft and housing design, adjustment of bearings, closures, cup and cone fitting practices, assembly methods and lubrication are treated in separate chapters. A full set of dimension sheets, drawn to scale, together with formulas and recommendations for the application of Timken bearings, comprise another section.

Automotive Industries
November 11, 1926



William M. Jardine

Ten Years of *Under Federal*

Nation's surfaced road mileage has doubled since 1916 and highway activities of all States have been coordinated by U. S. aid.

THE decade just past has been marked by greater improvement of the roads of the United States and a larger increase in highway transportation than any other in the history of the country.

As, from our present position, we look back upon the way we have come in these 10 years the progress seems truly remarkable. Coincidentally this same period covers the span of the Federal-aid road legislation and its administration under the Department of Agriculture.

As we entered the decade in 1916 there were less than 2,500,000 motor vehicles in the entire country, and less than 73,000 of these were registered as motor trucks. Today the trucks alone are more numerous than all motor vehicles at that time, and the total has doubled and twice redoubled in the 10-year period.

In 1916 there were approximately 277,000 miles of surfaced roads in the entire country, only a small percentage of which were of the types now regarded as adequate for motor vehicle traffic. Today the mileage of surfaced roads is nearly if not quite twice as great as it was 10 years ago and more than 100,000 miles are improved with types of surface more satisfactory for service than waterbound macadam—a record of progress the more remarkable if it is remembered that during this same 10-year period it has been necessary to reconstruct a very large part of the mileage previously constructed.

Trans-State Highways Increase

Ten years ago there were only five States in which there was as much as a single improved trans-state highway. They were Massachusetts, Connecticut, New York, New Jersey and Maryland—all Eastern States and all of that small group in which the movement for better highways had been begun in the nineties.

Today 25 States have improved highways continuous from border to border in at least one direction and 16 of these have completed such trans-state arteries in two directions.

In 1916 there were 16 States in which there was no State highway department that could be recognized as competent to administer the construction of Federal-aid roads, and they had no semblance of a plan for the development of a State system of highways. Even in those States in which the recently created State agency was endeavoring to introduce scientific and businesslike methods of highway improvement there were only a few in which a connected State highway system had yet been clearly conceived.

Today there is in every State a definitely designated State highway system to the improvement of which the State governments are applying their resources.

These remarkable changes, occurring within the brief period of 10 years, distinguish the last decade as the most important in highway history; but the developments which are destined to have the most far-reaching influence upon the future are the establishment of the Federal-aid policy and the elaborate and productive researches which have been carried out by the Federal and State departments and other agencies.

Of the Federal-aid policy it may be said that the 56,000 miles of road which have been improved under it are of less significance than the principles upon which the policy is founded, and which are thus given nation-wide importance.

Classification of Roads

It is a first principle of the Federal-aid policy that all roads, by the nature of their traffic, are stamped as of local, State or interstate importance, and that this fact should be recognized in the administration and financing of their improvement. The law has, therefore, required the designation of a definite Federal-aid highway system, including those roads of interstate importance in the improvement of which the national and State governments may properly combine their efforts.

From the first it has been required that the State should, itself, participate directly with the Federal agency through a department of its government competent to assume the responsibility. In retrospect, this provision of the law appears as, perhaps, the most important Federal contribution, responsible as it doubtless was for the creation and strengthening of highway departments in many of the States. It is a notable fact that these organizations are among the most efficient of State institutions, and it is certain that to them must be ascribed the largest measure of credit for the remarkable improvement of our highways. There is gratification, also, in the splendid cooperation which has at all times marked their relations with the Bureau of Public Roads.

The importance of the contributions to engineering science which have resulted from the research and experimentation that have been so vigorously conducted

* From an address before the annual meeting of the American Association of State Highway Officials, Pinehurst, N. C., Nov. 9, 1926.

Road Development Aid

By Wm. M. Jardine*
SECRETARY OF AGRICULTURE

since 1920 can scarcely be overemphasized. The Bates Road tests by the Illinois department, the Pittsburg, Cal., experiments and the various tests of the Bureau of Public Roads are known and studied throughout the world.

By the general adoption of the thickened-edge section, a direct result of this research, the public has already benefitted through increased service and lower costs, and the saving will go on as long as concrete roads are built.

As the result of a single study completed recently by the Bureau of Public Roads, by which it has been demonstrated that bricks of 2 and 2½ in. thickness may be used to give the service for which 3 and 4 in. bricks have previously been used, it is estimated that large annual savings are possible. A few thousand dollars and the earnest and devoted work of three or four of the bureau's engineers for less than a year have thus returned to the taxpayers of the States and municipalities, wherever brick pavements are built, many times the expenditure in potential cost reduction.

Building Methods Improved

Similarly, the bureau's studies of grading and concrete pavement operations have pointed the way to an improvement in the efficiency of such operations as a result of which it has been found possible in some cases with the same equipment to increase production by 50 to 100 per cent.

The results of these studies are immediately apparent in reduced costs and enhanced efficiency. In other cases, as in the studies of soils to determine their characteristics as highway subgrades and in the various investigations of the effect upon roadways of traffic and climatic influences, the object sought is complicated by so many variable factors that the studies must be long continued before definite results may be expected. But these researches, penetrating as they do to the very fundamentals of highway design, are likely in the end to be most valuable of all, and it is not only possible but probable that future generations of road builders may regard them as in the same category as those fundamental observations by which the design of bridges has been converted from a rule-of-thumb process into an exact and dependable science.

Turning from retrospection to the contemplation of the future, I am impressed with the necessity of making adequate provision for the increasing service that will be expected of the highways.

If the number of motor vehicles has increased from 2,500,000 to 20,000,000 in 10 years, there is no reason to believe that the increase will be abruptly halted now, although we may expect some falling off in the rate.

As traffic increases directly in proportion to the motor vehicles in service, we must expect that the conditions for which we now build will be intensified in the future. The highway service we are now providing must be capable of expansion to meet the needs of the growing traffic as these mature.

Problems Vary in Different States

Doubtless the concern of the immediate future is not for all States the same. To some it is the completion of an initial improvement of a large mileage, previously unimproved, in the face of a demand for more adequate facilities on some highways already well developed. To those who face this situation the problem is to get traffic through—to effect some degree of improvement over a whole highway system as rapidly as possible in order to give the greatest satisfaction to the greatest number of people.

Other States—more fortunate, I believe—have systems of main roads already improved and largely surfaced, and the immediate concern is the selective betterment of sections of the systems to relieve congestion, eliminate danger, and generally to adjust the existing improvement to the growing needs of a still increasing traffic.

To all alike, however, the problem of the present is to serve as adequately as possible the present needs, keeping in mind at the same time the greater needs of the future, and making suitable provision for their accommodation when the time arrives. This is the policy of stage construction, a sound policy because it recognizes the utter impossibility of building once for all a system of highways which may be regarded as a finished product, but rather substitutes for that conception the principle of progressive improvement.

The construction of earth roads on the lines and grades and with the drainage provisions that will be required by the pavement of the future is a recognized application of the stage-construction principle. But it has

Reducing Road Costs

AS the result of a single study completed recently by the Bureau of Public Roads, by which it has been demonstrated that bricks of 2 and 2½ in. thickness may be used to give the service for which 3 and 4 in. bricks have previously been used, it is estimated that large annual savings (in highway construction) are possible.

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Similarly, the bureau's studies of grading and concrete pavement operations have pointed the way to an improvement in the efficiency of such operations as a result of which it has been found possible in some cases with the same equipment to increase production by 60 to 100 per cent.

of course a very much wider application than that.

The acquisition of rights of way of ample width for the future so that, when the need arises, it will be possible without heavy expense or the injury of private property to effect the necessary improvements, is another highly important application.

The same foresighted policy suggests the location of the improved highways in relation to railroads at crossings in such manner as to provide satisfactorily for separation of grades, and it applies also to provisions for the construction of future by-pass highways around cities, and for the diversion of traffic from routes of growing congestion.

Studies of Future Needs

To anticipate thus the needs of the future implies a knowledge of the probable traffic importance of the various roads which can only be obtained by a careful and detailed study of the present distribution and the factors inherent in the economic and physical characteristics of the State. Such studies have been made by the Bureau of Public Roads in cooperation with the highway departments of a number of the States, and the reports, recently published, are doubtless familiar to many.

The highway department that has in its possession such information as these surveys supply can really plan for the future. It has substituted facts for opinions; it knows the present and probable future importance of its roads; it knows the density and also the weight of the traffic to which each road is now subjected and to which it is likely to be subjected in the near future.

It can, therefore, devise a reasonable program of construction extending into the future; it can budget its funds intelligently; it can determine the order in which the various highways should be improved and give a satisfactory answer to those who favor priority for other roads; and it has in its possession an adequate basis for the necessary decision as to the character of improvement required for each road.

This is sound and business-like administration of highway improvements. It is the reverse of the casual and haphazard procedure which too often has subjected the business of highway improvement to political manipulation, and produced discontinuous, unbalanced and uneconomical development instead of well articulated systems of improved highways.

In the Federal-aid work we feel the need of such precise information daily and I look forward hopefully to a not far distant time when it will be available in all States.

Disadvantages of County Aid

Not all the exact information it is possible to obtain, however, will suffice to provide an orderly and systematic improvement of the main roads in the States which still rely upon the financial assistance of the counties to carry out the State program.

Certainly there has been experience enough to prove that complete connection of main arteries is practically impossible so long as there is dependence upon county financing. The reasons are perfectly obvious. All sections of the major State roads in the various counties are not invariably the roads in which the county interest is the greatest. By their very nature the roads of the State and Federal systems are the most heavily traveled highways. In many instances the traffic which demands their improvement is contributed in a smaller degree by counties through which they pass than by other counties or even other States. It is not unnatural that the authorities of such counties should be unwilling, and they often are financially unable, to assume a share in the cost of the improvement.

So long as any State fails to provide State funds for such roads the development of the main State and interstate roads along strictly economic lines will be hampered.

Full operation of the provision of the Federal highway act which aims to correct this condition has been twice deferred in the Federal legislation to give the States concerned more time to correct their laws. There ought to be no further delay. I hope that the necessary laws and constitutional amendments will be provided before the Congress shall again have this legislation before it for further action.

It is manifestly unfair to the counties themselves to expect them to participate in the cost of improving the main lines of traffic. To do so places a burden upon them which they should not be expected to bear. The improvement and upkeep of the roads tributary to the main systems are of the highest importance to agriculture and the county and local funds must be preserved for this purpose.

The traffic on the State roads is a wide-ranging traffic. The greater part of it originates in and is destined to the cities, and any system which causes the rural communities to contribute to the expense of improvement in greater proportion than the benefits they derive is unfair and ought to be remedied.

Also there must be a still greater improvement in the maintenance of all roads and especially of the Federal-aid roads, an obligation which the Federal law places upon the State highway departments. While unquestionably there has been great improvement in this respect during the last decade, the failure to make proper provision for the repair of roads upon which large sums of public money have been invested is the sheerest of economic folly.

Maintenance Must be Insured

Unless there is positive assurance that means will be available for the constant and continuous care of the roads after they are improved, I am convinced that it would be better not to improve them at all.

It has not often been necessary to enforce the provisions of the Federal highway act in respect to nonperformance of the necessary maintenance work on Federal-aid projects. With few exceptions the obligation of the States has been carried out. There are a few—no more than can be counted upon the fingers of one hand—upon whom it has been necessary to call repeatedly for essential work to save the Federal-aid roads from deterioration. The department has been patient in dealing with such cases and our requests have always been met with a response, but maintenance that is delayed until the deterioration has advanced to the point where it becomes necessary to direct attention to it, is not the right kind.

While the States in accepting the Federal appropriations accepted also the obligation of keeping the roads in proper repair, the deeper obligation is that of rendering the best possible service to the public and of protecting public investment.

Neither the public nor the legal obligation can be satisfied by a perfunctory highway maintenance policy. The department has endeavored to deal in a straightforward way with its duty to enforce the law in this respect. There has been no tendency to pick flaws of a minor character or to look with unsympathetic eyes upon the efforts of the States. It is not a pleasant duty to serve a formal notice required under the law upon any State, and it is still less pleasant to withdraw Fed-

eral participation. The department believes, however, that its first duty is to insure proper maintenance of the roads constructed with Federal funds.

There are a few States in which there have been too frequently reports of projects in an unsatisfactory state of maintenance, and may I take this opportunity to urge very seriously upon these States, which cannot themselves be satisfied with such conditions, their immediate correction. The department wishes to make clear its position that the duty to maintain roads already constructed is paramount.

With each year's progress now it becomes easier to see the working out of one of the primary conceptions of the Federal-aid road legislation as expressed in the requirement to expedite the completion of an adequate system of highways interstate in character. It was foreseen that the fulfillment of this purpose would come through a linking up of sections of main highways as they are developed State by State, and up to this time the programs within the States have in general been in harmony with the expected progress in the direction of through routes. In some cases the department has taken definite positions with reference to specific projects to provide missing links, usually in the way of bridges at State boundaries, but now with the major routes of the country so clearly defined by the action of the States, the unimproved sections of these routes have been brought in strong relief.

It is now possible to travel from Washington through St. Louis, Texarkana, and El Paso to San Diego, over a transcontinental route of which 97 per cent is improved—93 per cent is surfaced and 4 per cent is graded and drained.

More Than Half Hard Surfaced

Of the surface portion more than half is improved with bituminous macadam or higher cost types and the remainder is gravel. From Washington to St. Louis there is no unimproved section and nearly 96 cent is surfaced with bituminous macadam or one of the higher type materials. From St. Louis to Texarkana, 2 per cent of the distance is unimproved and 63 per cent is improved with a gravel surface, the rest with superior types. From Texarkana to El Paso there are unimproved sections equaling 4 per cent of the distance, gravel surfaces 50 per cent and bituminous macadam or superior type the rest of the way. From El Paso to San Diego, with the exception of 6 per cent of the distance, the road is surfaced, 60 per cent with gravel and the remainder with pavements and surfaces of higher types.

This is the possible transcontinental route, totaling 3133 miles, most nearly surfaced; 2907 miles are surfaced and 131 miles are graded and drained, leaving only 95 miles without improvement. This route does not coincide with any one of the United States routes but it does indicate the splendid progress that has been made by the States it traverses in the completion of important trans-state routes.

CERTAINLY there has been experience enough to prove that complete connection of main arteries is practically impossible so long as some States depend upon the counties to finance such projects.

The reasons are obvious. All sections of the major State roads in the various counties are not invariably the roads in which the county interest is the greatest.

By their very nature the roads of the State and Federal-aid systems are the most heavily traveled highways. In many cases the traffic which demands their improvement is contributed in a smaller degree by counties through which they pass than by other counties or even States. It is not unusual that authorities of such counties should be unwilling, and they often are financially unable, to assume a share in the cost of improvement.

Considered from the standpoint of improvement, the next ranking transcontinental route is that from Atlantic City to Astoria. Of its total length, 3240 miles, 12 per cent is still unimproved, another 12 per cent is graded and drained, and the remaining 76 per cent is improved with some form of wearing surface.

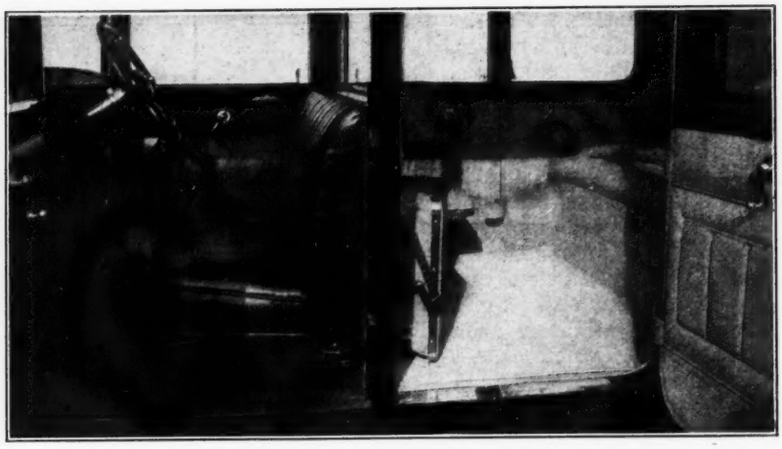
Of other east and west routes, that from Norfolk to Los Angeles is 68 per cent improved and that from Chicago to Los Angeles partly by the same line is 63 per cent improved. From Boston to Seattle, through the northern tier of States, the most direct through route is 73 per cent improved and 69 per cent surfaced.

It is my feeling that the progress in the completion of transcontinental roads is gratifying, but I do not lose sight of the fact that the lack of trans-state routes in the agricultural States of the Mississippi Valley is not in keeping with the development, east and west. In specific States this condition is brought about more largely by the feature referred to above, that is, the dependence upon county financing, than by any lack of need of such roads or lack of response on the part of the State highway departments.

Now that there has been plainly pointed out and defined the through routes which are of major national importance, there should be an energetic effort made to improve the missing links, not because they are transcontinental routes but rather because in general these unimproved sections lie on the most important State routes, and the failure to improve these imposes a handicap upon the people of each State in the satisfactory use of their own road systems. But the national use must not be lost sight of, nor the requirement of the national legislation that these interstate routes shall be expedited.

The department has not attempted to dictate the routes which should be regarded as major State routes. Each State highway department has expressed in a definite way the routes which are of the greatest importance within the State. In other words this system has been built from the local viewpoint upward and not from the transcontinental viewpoint downward.

But having now settled upon these routes, which in the last analysis the public itself has defined by their use, it becomes our duty, the Federal and State highway departments working in cooperation, to expedite their completion. There are approximately 80,000 miles of highway included in these routes. To complete them to a state of improvement satisfactory for present use is a matter of closing gaps. I am convinced of this, the initial improvement can be completed by 1930 without difficulty, and as a definite objective I can think of no expenditure of effort which would bring with it a greater return of public satisfaction or any more intelligent method of keeping faith with both the Federal and State governments which have entrusted to us the administration of these large funds.



Left—In this 1921 Haynes is shown the first use of leather as closed car upholstery, the individual driver seat being covered with a Spanish grain. Above—A later use of leather was to cover the entire front seat of closed cars as shown in this Renault limousine

Special Finishing Methods Are Developed for Soft Upholstering Leathers

Tanners now supplying products which are more suitable for use in closed cars. Greater care taken in selection of hides. Dyes are put on with spray gun.

By K. W. Stillman

TANNERS in recent years have developed new products, notably dyed leathers and moroccos, which are coming into rather extended use as upholstering materials for closed cars. These new products differ from the leathers which have been in common use for open cars in that they are much softer, can be made in various colors and combinations, and are in general more suitable for employment in closed cars.

Because of the extent to which these materials are being used at present it may be of interest to describe briefly the manner in which soft leathers are produced and wherein they differ from the familiar Spanish grains which have been employed so often for open car upholstery.

Essentially the only difference between soft leathers and other kinds rests in the finishing methods used. Soft leathers, in spite of their flexibility, warmth and softness possess all the inherent qualities of other grades of leather and are long wearing, easy to clean and very little affected by moisture, grease and similar things. In making them, more care is used in selecting hides, certain tanning processes are altered slightly to keep the leather soft, but, principally, the qualities are obtained by the type of finish which is applied to the tanned piece.

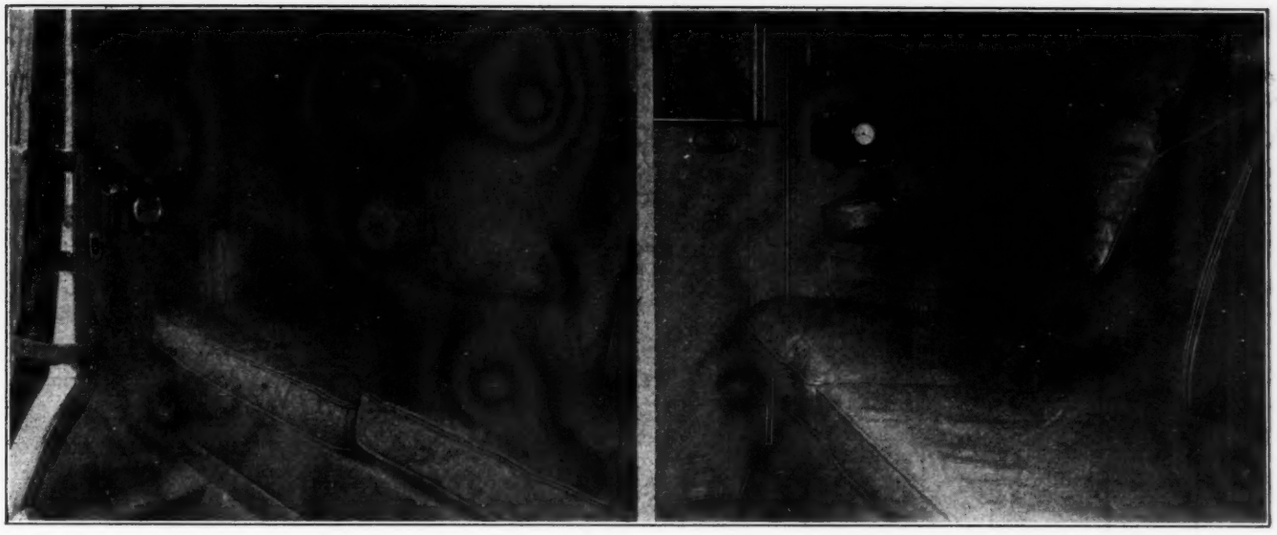
In making soft leathers, the Radel Leather Company, of Newark, N. J., which has done considerable development work with this type of product, is very careful in selecting hides to be used for the purpose. In fact, only steer hides imported from Germany are employed because in Germany steers are not permitted to roam the fields and so their hides are more free from defects than most others. These hides are carefully removed, salted, packed in bundles and shipped to the New Jersey plant.

These steer hides upon arrival at the tannery are trimmed and then washed in clear water to restore them to the condition they were in before being salted. A series of brushing operations eliminates all the bits of flesh and fat which may have been left on the hide, and after being left in lime solutions for a period of from six to seven days the hair is removed by a scraping machine.

Ready for the Splitting

After being put through another bath of chemicals for the purpose of removing the lime, the hides are hung from racks and lowered into the tanning solution. After about eight days in the tanning solution they are wrung out and are flattened for splitting. This process is performed by an endless steel belt knife which has a very delicate adjustment so that the thickness of the cuts taken can be determined with great accuracy.

Two methods of splitting hides are commonly employed. In one a very thin slice—about 1/64 in.—is first taken from the hair side. This is called a buffing and is used for book bindings, wallets and such articles. The rest of the hide is split into three parts of about



Left—With the development of soft leathers, these materials are now used in rear seats of closed cars. This Le Baron cabriolet on Pierce-Arrow chassis is upholstered in tan Morocco leather. Right—An Issotta sedan upholstered with one of the new soft leathers

equal thickness called, beginning at the hair side, machine buffing, No. 1 split and No. 2 split. Under these there is also the slab or leveling cut but this is not used for automobile upholstery leather.

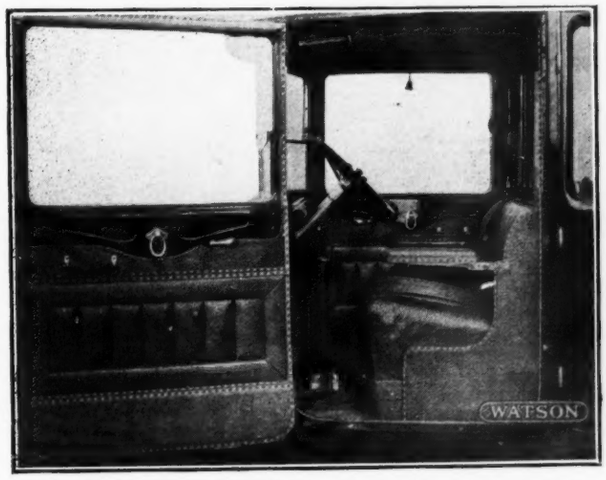
The second method of splitting is the same as the first except that a buffing cut is not made but the first cut, which goes down to the No. 1 split, includes all the grain and is called the full grain or hand buff. The first cut taken from the hide contains the natural grain and is of course the most valuable cut of all. It is this cut which Radel Leather Co. uses for making its dyed leathers.

After being split, the various cuts are immersed again in the tanning solution to complete the process which was commenced before splitting. Upon completion of the tanning the pieces usually receive a coat of oil and are then dried in preparation for the finishing processes.

The Radel company uses spray gun equipment to apply the dyes with which their product is finished, this method having the same advantages over the old brush methods of application as are to be found in spraying automobile finishes. On top of the dye coats, usually two or three, a dressing of nitro-cellulose material is generally applied which greatly prolongs the life of the finish.

As stated before, most of the dyed leather is made from full grain stock with the natural grain of the hide left in view. Other splits can also be used, however, but these must have a grain impressed upon them.

So-called mosaic leathers are made much in the same way as standard dyed leathers except that a second coat of contrasting color is sprayed over the first coat and this latter coat, when partially dry, is rubbed down with some rough substance such as burlap. This leaves the raised portions of the surface finished with the first color while depressions in the grain carry the color of the second coat. By this method very beautiful and elaborate leathers can be produced, which, coupled with the softness and warmth inherent in leathers produced for this purpose, make very satisfactory upholstering material for the most luxurious automobiles.



A striking use of leather by a British custom body builder for an Armstrong-Siddeley limousine. Note the hinged arm rests

New British Airships to Have Heavy Oil Engines

IN an address at the British Dominion and Colonial Premiers' Conference in London, Sir Samuel Hoare minister for air, dealing with the subject of "Imperial Air Communications," stated incidentally that the airships now being constructed at the Cardington Airship Station will be equipped with heavy oil engines, these having been adopted in preference to gasoline engines in order to reduce the fire risk, though they will be of additional advantage when operating in tropical climates. The structure of these two airships, Sir Samuel said, will be incomparably stronger than anything of the kind previously built.

Two days before Sir Samuel delivered his address, a Diesel type airplane engine built by William Beardmore & Co., of Glasgow, underwent a successful six-hour test. No information as to the details of this engine is yet available, but Lord Invernairn, the chairman of the company, in an interview stated that with six cylinders only it developed 950 b.hp. at 1350 r.p.m., on 15 per cent less weight of fuel than the average airplane engine operating on gasoline.

Six-Cylinder Cars and Overhead Valves Feature British Design

Of 29 new fours and sixes, 19 come under latter classification and 10 have piston displacement of 150 cu. in. or less. Overhead valves on 22 out of 33 new models.

By M. W. Bourdon

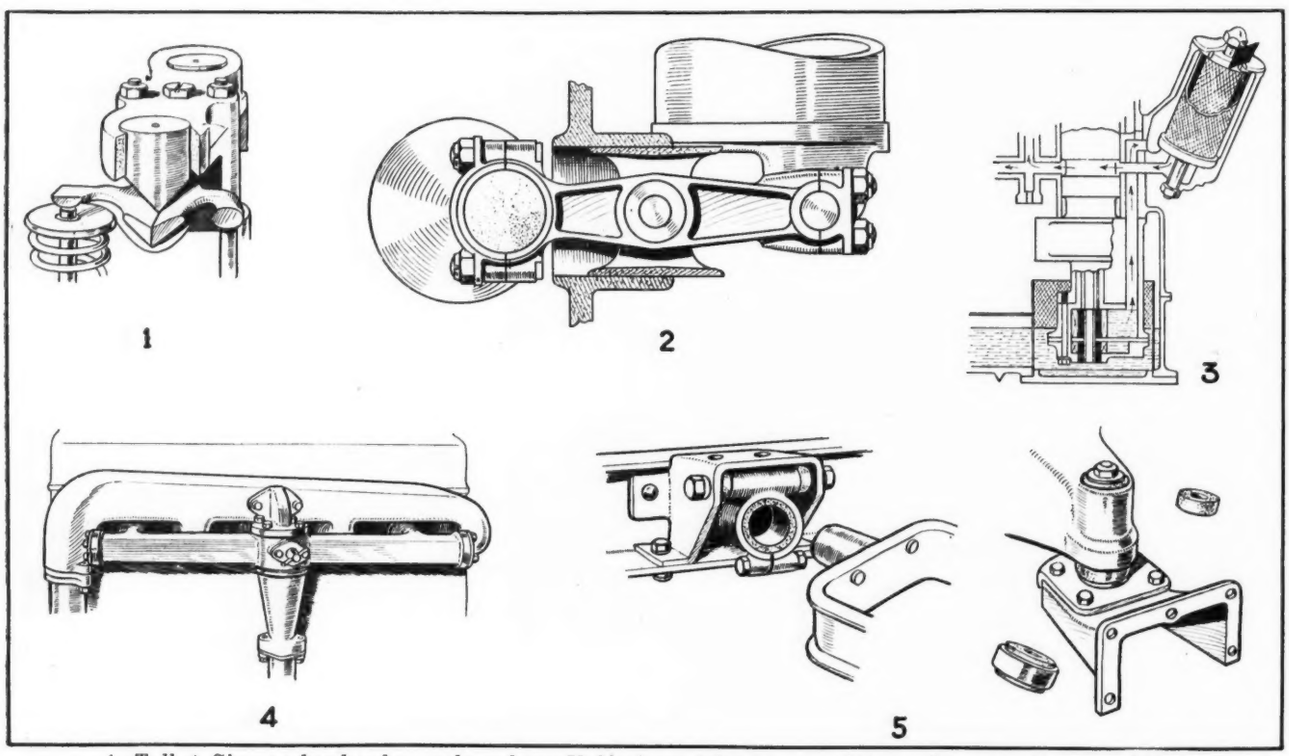
AS I reported in my cable from the Olympia Show, the outstanding development in British design is the large proportion of six-cylinder cars among the new models. For the first time the new sixes exceed the fours numerically.

Of 29 new fours and sixes, 19 come under the latter classification, and it is notable that of these, 10 have a piston displacement of approximately 150 cu. in. or less. There are three of 102-103 cu. in.

Moreover, whereas British six-cylinder cars hitherto (with two exceptions) have been high-priced jobs in relation to the corresponding fours, most of the new models are proportionate in price. Thus, taking a make of which both a four and a six are now available, the four-cylinder 119 cu. in. Standard is £275 for the open car while the six-cylinder 136 cu. in. model is £345, and some of that difference is due to the six having a Dewandre servo for the four-wheel brakes.

The next point of note is the overwhelming numerical superiority of overhead valves. Of the 33 new models, 22 have overhead valves, two have the inlets overhead and only five have side valves. Three others have sleeve valves and one is a valveless two-stroke type.

Overhead camshafts are also well represented this year; Wolseley has one for a two-liter six, and among other makes are Lea-Francis and Vulcan with two overhead camshafts and Beverley Barnes (straight eight) and Brocklebank with one. On the other hand, Rhode has a new four with pushrods superseding an overhead camshaft four of approximately the same



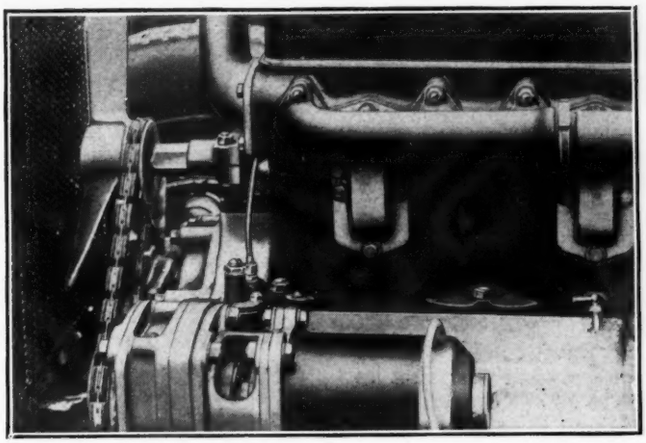
1. Talbot Six overhead valve rockers have V block as fulcrum. 2. Aster valve operating crankshaft and connecting rod for Burt & McCollum single sleeve valves. 3. Humber dual oil pump and filters. 4. Rectangular induction manifold of Brocklebank Six. 5. Front and rear engine mountings of new Wolseley Six

size. The two new models with overhead inlets and side exhausts are both Humbers (a four and a six), which maker has two "continued" models with the same valve arrangement.

The new models with sleeve valves are a 12-cylinder Daimler (Knight sleeves), a six-cylinder Aster (Burt & McCollum) with steel sleeves and a new operating layout eliminating skew gears, and a larger Argyll.

Where pushrod operation is used there is a widespread tendency to fit a coil spring between the pairs of rockers, the spring encircling the rocker shaft and preventing clatter due to end wear of the rocker bosses. Another trend is to drill the rocker arm to the pushrod end to convey oil pressure from the shaft to the socket (for the majority of overhead valves have pressure lubrication), while Sunbeam goes farther and also drills an oil hole to the valve end of each exhaust rocker to lubricate the valve stem, though the inlet valves are made to depend as usual upon oil mist in the overhead valve casing.

Among the new sixes are examples with every feasible number of crankshaft bearings. Austin has eight, with the timing gear sprocket between the seventh and eighth bearings. There is one evident advantage of this rear end location for the camshaft drive, aside from its greater immunity from crankshaft torsion. That is, it enables the cylinder block to be carried approximately two inches farther forward and as the dashboard goes that much farther too, the available body space is proportionately increased.

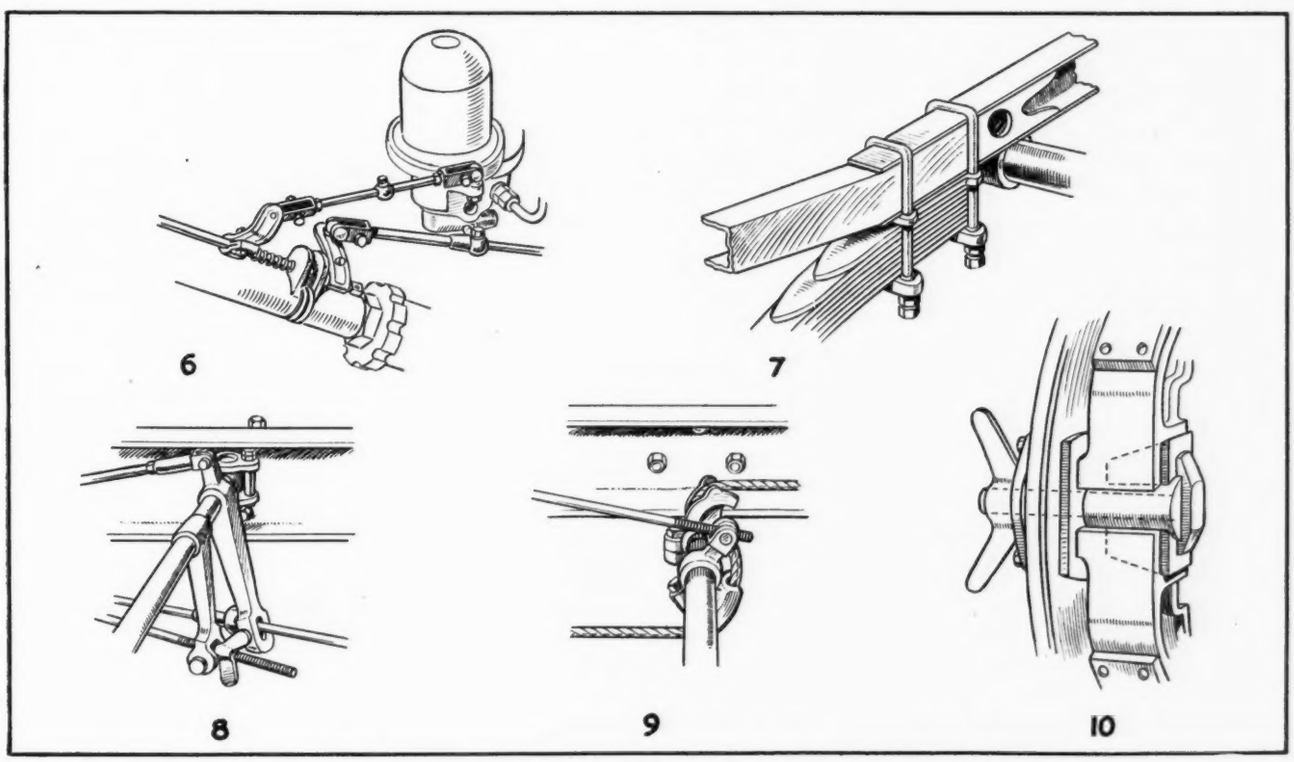


Left side of engine of new Bean Six. View shows exterior ducts for water circulation from cylinder block to head, and expansion joint at center of exhaust manifold

Counterweighted crankshafts are found in only a small proportion of new models, and much the same applies to vibration dampers on the new sixes. On the new Beverley Barnes straight-eight there are two dampers, however, one on the crankshaft and the other on the overhead camshaft, the top one serving also as a friction clutch for the direct drive of the fan.

Duralumin connecting rods are now so frequently used as to call for no remark.

Thermo-syphon water circulation is still normal for engines up to two liters, though there are one or two new models with a pump, and one or two others with an "accelerator" at the rear end of the fan shaft. The return to this last feature (for it was much more prevalent a few years ago than of late) has not been accompanied, however, by the re-adoption of belt drives for the generator, as is the case in several Continental cars; but more makers of small cars are using a combined generator and starting motor and a



6. Morris levers clipped on throttle and ignition control rods, with adjustable coupling rods. 7. Rear end of frame of Singer Junior (8 hp. light car), with extension supporting extremity of body. 8. Bean spherical bearing for brake cross-shafts. 9. Wolseley S lever for compensation on fore and aft brake cable. 10. Wedge brake adjustment at pivoted end of shoes in new Talbot Six

new six-cylinder Talbot is one instance of the dynamotor being coupled to the front end of the crankshaft.

A further attempt is being made in a few quarters to induce buyers of British cars to accept coil ignition, for the Talbot six and the smallest of three new Sunbeam sixes are thus fitted, though on the former provision is made for fitting a magneto either instead or in addition. Beyond these isolated examples and a miniature four, the Gillett, offered for £100, the magneto is still universal.

Dual System of Lubrication

Full pressure lubrication has almost completely displaced both the trough (splash) system and that in which troughs are used under the big-ends with pressure leads to the main bearings of the crankshaft. It is exceptional, however, for pressure to be carried up to the piston pins. On two models introduced by Humbers, a dual system of lubrication is used. There is a duplex gear pump of which a larger section delivers oil under high pressure to the crankshaft, distribution and overhead inlet valve gear, while the smaller sections feed troughs under the big-ends at low pressure. The advantage of this duplication appears to lie in the reduced risk of the cylinders and pistons being starved of oil while the latter is warming up from stone-cold in the winter months. The low pressure system is also, of course, a safeguard in the event of failure of the high pressure side, but that is hardly sufficient reason for the addition.

A duplex lubrication system also appears on an eight (Beverley Barnes), but the object in this case is merely to feed the overhead camshaft at a low pressure (4-6 lb.) and avoid the undoubted risk of erratic delivery through a reducing valve from the high pressure (80-100 lb.) system of the crankshaft, etc.

No British maker has attempted to secure better oil filtration than can be had by metallic gauze, and although a few have duplicated their filters or the gages, the majority are satisfied to use one filter with one layer of gauze, though there is a widespread tendency to make that one filter larger and to locate it where it can be cleaned without disturbing the oil in the crankcase. Air cleaners and anything in the form of an oil distillator are other accessories favored in America that find no place on British cars.

Nearly all the new sixes have induction and exhaust manifolds separate from the cylinder block and from one another, the induction manifold usually being a straight unit extending an inch or two beyond the end branches to the cylinder ports. Single and dual carburetors for sixes are about equally divided.

Talbot has adopted a novel scheme in fitting the carburetor at the front end of the straight manifold and inserting a choke tube in the latter; this is said to insure uniform distribution so long as the tube is precisely positioned and dimensioned as predetermined by experiments. The rectangular section for induction manifolds appears in a few additional makes, notably Wolseley. But the scheme of arranging the downtake of the exhaust at the front end of the engine is clearly increasing in favor, the object being, of course, to keep it as far away as possible from the body, a desirable feature in connection with closed bodies.

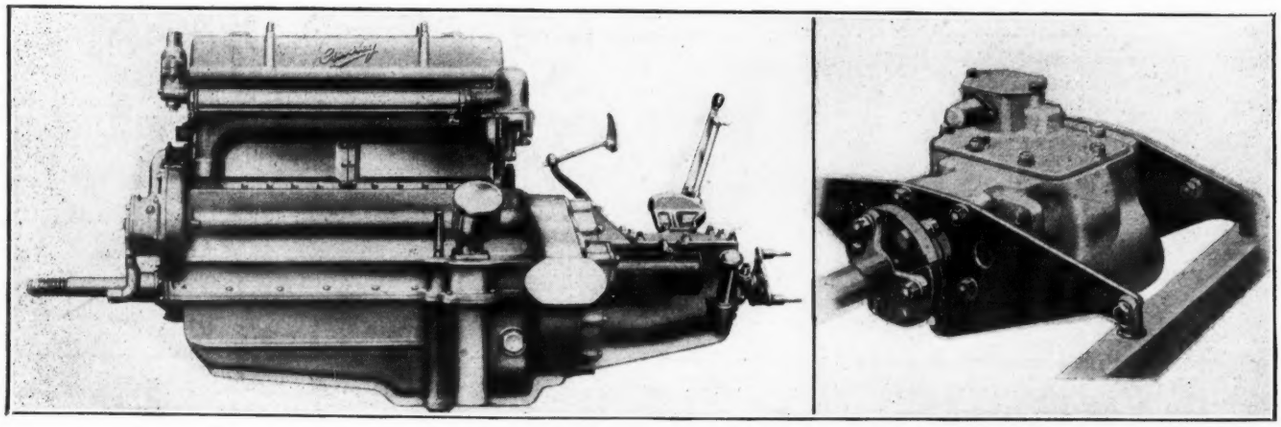
Much has been done to protect the engine against frame distortion and the frame from engine vibration. The most popular plan is to use a four-point suspension with the bearer arms resting on rubber blocks or helical springs. Wolseley, on the other hand, uses a true three-point suspension, for the trunnion at the front end has a rubber bushing in its bracket.

The Talbot six is of note in having two forward-projecting bearer arms at the front of the crankcase to support the radiator, one of them being the end of a water duct in the unit cylinder block and crankcase casting and eliminating a separate return pipe.

An increasing tendency in connection with engine suspension is to use a pressed steel plate bolted between the rear end of the crankcase and the flywheel housing with side extensions to form the rear bearers of the power plant. One maker (Standard) does this with a separate gearset and has a similar plate at the front between the crankcase and the distribution casing. In this instance the plates are merely cut from flat steel sheets and are not flanged; their ends rest in slotted eyebolts on the side rails, with rubber buffers. The same suspension is provided at each end of the gearset, which is mounted in a triangulated subframe.

Plate Clutch Generally Used

It is quite evident from the frequent changes in the details of single-plate clutch design that many makers are not yet satisfied with this unit. There is no firm specializing in clutches and every car manufacturer makes his own. On the whole the plate clutch is gradually ousting the cone type, though several firms who originally adopted the single plate now use two driven plates.



LEFT: *Exhaust side of power plant of Crossley Six.* RIGHT: *Gearset and engine mounting of Standard Six*

Apart from attempts to reduce the noise on indirect ratios there is no change in gearset construction to record. More makers are grinding-in their constant mesh and indirect gears. Wolseley does this to the constant mesh and third speed pinions only, while the corresponding gear wheels in another new model (the Riley) have helical teeth, the third speed being also in constant mesh and brought into use by a dog clutch.

Behind the gearset the general position is "No change." Makers who have been using worm drives in the past are continuing them on new models, and there has been one accession to their ranks, Morris, who uses a worm drive on the new 16 hp. four.

In regard to springs, the quarter-elliptic, which made such headway during the first few years after the war, is rapidly being displaced by the half-elliptic. This is due to the provision of front brakes, for which semi-elliptics are more suitable. Sunbeam is almost alone among makers introducing new models in using cantilever rear springs.

Aside from two or three makers who give an option on front brakes on cars of over 67 cu. in., all others furnish them as standard equipment. Morris is one of the exceptions. On cars below 67 cu. in. front brakes are sometimes fitted; on the Austin Seven, for instance, the front brakes are separately operated.

Brakes in general are larger. Compensation between front and rear and between the pairs, back or front, is much less frequently found. As a rule, an accessible "central" or service adjustment is provided for all four brakes (two makers bring a hand wheel through the front floorboard) and individual adjustments on the ends of the pull rods alongside the brake drums.

Progress of Recent Years Summed Up in New Edition of "The Gasoline Engine"

By Donald Blanchard

AUTOMOTIVE design is now in a stage of gradual evolution. Engineering brains are concentrated more on the refinement of existing types and on economical manufacture than on the development of new mechanisms involving radical departures from previous practice. Under such circumstances it is natural for those of us who are in close and constant contact with the doings of the industry to underestimate the real progress that is being made. Yet, fully to appreciate how far we have progressed in recent years, it is necessary only to compare present models with those produced immediately following the end of the war.

These thoughts are occasioned by a perusal of the seventh edition of "The Gasoline Engine" which has just been published by P. M. Heldt, engineering editor of *Automotive Industries*. The sixth edition published in 1920 reflected the status of the art of engine design in the post-war period. In the intervening years such vast strides have been made toward the perfection of the powerplant and in reducing the cost of manufacture, that in many respects the previous edition has become obsolete. Because of this development, the latest edition is practically a new work on the subject—a large proportion of the text having been entirely rewritten.

The theoretical and analytical presentations on the fundamentals on which design is based—are not greatly altered, as these elementary principles have not changed. However, where necessary, these sections have been expanded to cover the subject more completely and to simplify calculations. Particular attention has been paid in the new edition to vibration and the elimination of its causes in the engine, as perhaps more attention is being given this subject at the present time than to any other phase of powerplant design. The balance of the vertical eight and the various types of the V engine are considered in detail and the discussion of torsional crankshaft vibrations has been expanded in the light of present knowledge. Similar attention is paid to the design of reciprocating parts for lightness, and to the advances which have been made toward quieter front end drives and valves.

Among the entirely new features of the book are chapters on bearing loads and Diesel automotive engines.

Much new and valuable material has been added to the chapter on "Power Output and Other Engine Characteristics." One of the most interesting features of this chapter is a curve showing the range of brake mean effective pressures in current passenger car models and which also illustrates the trend toward higher pressures. At the bottom of the range is a four-cylinder engine whose design has not been changed materially in many years. This engine shows a maximum b.m.e.p. of 75 lb. per sq. in. at a piston speed of about 550 ft. per min. At the top of the range there is an engine in a high-priced car showing a maximum b.m.e.p. of nearly 120 lb. per sq. in. at a piston speed of 1500 ft. per min. All other engines in current production lie between these extremes.

The chapter on water cooling has been brought up to date by the inclusion of evaporative cooling while latest practices in the air cooling are discussed in a chapter devoted to that subject. This latter chapter is of particular importance because of the interest aroused in this method of cooling by its widespread adoption in the aircraft field. Superchargers and two-cycle engines also are covered in the seventh edition. All of the plates at the end of the book are new with exception of the drawings of the Class A Army truck engine.

The subject matter is presented with a thoroughness and a clarity of expression that is characteristic of the author. Engine design and manufacture are covered in as much detail as it is possible to do within the limits of one volume of some 600 pages. Perhaps the treatment of the subject would be more complete had chapters covering starting, lighting and ignition systems and carburetors briefly, been included, but inasmuch as these subjects are each covered in separate volumes by the same author, the omission of this material is not important. The new edition is in every respect a worthy successor to its predecessors which have earned places for themselves as among the standard reference and textbooks of the industry.

Dynamic and Static Steel Testing Methods Discussed

Relation between results of impact and static tension tests, and impact and static bending tests, treated in paper read before Institute of Metals.

IN a paper read before the Institute of Metals at Liege, Belgium, recently, Prof. Kataro Honda, D. Sc., of the Research Institute for Iron, Steel and Other Metals, Sendai, Japan, discussed the principles underlying the static and dynamic tensile and notched bar tests.

He pointed out that machines for testing materials have increased considerably in number and that the following tests are now common: Tension, bending, torsion, toughness, fatigue, abrasion, hardness, and single and repeated impact tests. Since for each of these methods there are several types of machines, the number of types of testing machines as a whole is very large, and, further, new machines are continually being invented. Consequently, it is of importance to study the merits and demerits of these machines and to make a selection of those which are best for the purpose. An investigation along this line has been started in the Sendai Research Institute.

The paper under review was devoted to a consideration of the relation between the results of impact and static tension tests, and impact and static bending tests, while some consideration was given also to the method of measuring fatigue.

In breaking a test piece, the force which resists the breaking action is the atomic force. When the atoms constituting the test piece are in their usual position of equilibrium, the forces of attraction and of repulsion between them are in equilibrium and their resultant is zero. If an external force is applied to displace the atoms, these forces come into play. The forces of attraction and repulsion are functions of the distance between adjacent atoms.

The work represented by separating the atoms adjacent to the plane of fracture against the forces of atomic attraction, is quite small, however, as compared with the total amount of work which must be done in breaking a test piece. The work thus required may be divided into three parts, as follows:

1. The energy required for simple breaking of the test piece.
2. The energy required for deformation.
3. The kinetic energy due to the speed of the parts when the break occurs.

The first part is the potential energy of the surface of separation and is very small. Of the second part, which is the principal item, a small fraction remains in the specimen as the potential energy of interstrain, while the remaining part escapes as heat energy after the break. The third part, the kinetic energy, is a small item and is finally emitted as heat energy.

Thus the quantity of heat generated at the time of breaking must be somewhat smaller than the whole work done. This has already been confirmed by H. Hort, who in experimenting with a test specimen of Krupp iron 2 cm. in diameter by 9 cm. long, found that the work required for breaking was the equivalent of 118.8 gram-calories, and the heat generated, 106.8 gram-calories. The two parts of the energy expended which do not appear as heat are the work required for simple breaking of the test piece and the potential energy of the interstrain. The former is insignificant in amount and most of the difference between work done and heat measured is undoubtedly accounted for by the energy of internal strain. Attempts are being made in the Sendai Institute to measure the energy of this internal strain by means of a high temperature calorimeter.

In the case of notched bar tests it has been found that in many cases the work required for the break is not proportional to the sectional area of the notched part. This is due to the fact that the volume of metal which is subjected to strain is not proportional to this area. However, in the case of Moser's experiments the ratio of work done to volume of metal subjected to strain remained constant.. If the same deformation is caused in static and dynamic tests, the energy required must be the same in the two cases, as this is determined chiefly by the deformation, and depends only on the relative states of the test piece before and after the break.

More Energy Absorbed by Impact

In the case of tension tests it is, however, observed that the energy absorbed in the impact test is generally greater than that absorbed in the static test. This difference is also due to the difference in deformation in the two tests. Thus, if the general elongation be less in the impact than in the static test, the local elongation may be greater in the former than in the latter. Hence, though the total elongation be the same in the two tests, the actual deformations may differ from each other, and the energy absorbed may be greater in the impact than in the static test.

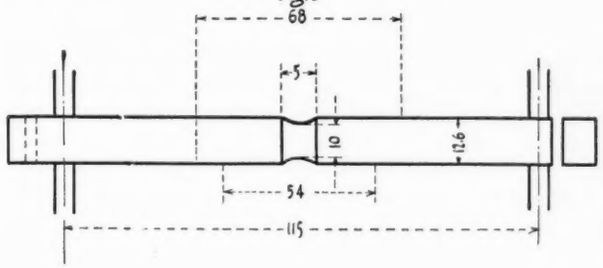
Tests made at the Sendai Institute on tensile specimens 10 mm. in diameter and 100 mm. gage length showed that the ratio of the work of rupture in dynamic tests to the work of rupture in static tests varied with the carbon content as follows: 0.1 per cent, 1.28; 0.3 per cent, 1.48; 0.5 per cent, 1.41; 0.7 per cent, 1.34; 0.9 per cent, 132.

In the case of bending tests the same amount of energy is required in both static and dynamic tests. This means that with the same specimen the break occurs at the same bending angle. According to R. Yamada, the work is proportional to the angle of bending and the straight line which represents the relation passes nearly through the origin. This result is further confirmation of the conclusion previously drawn, that the work re-

quired for breaking a test piece without any deformation is very small.

Some scientists have tried to account for the difference in the amounts of energy required for breaks in

Fig. 1



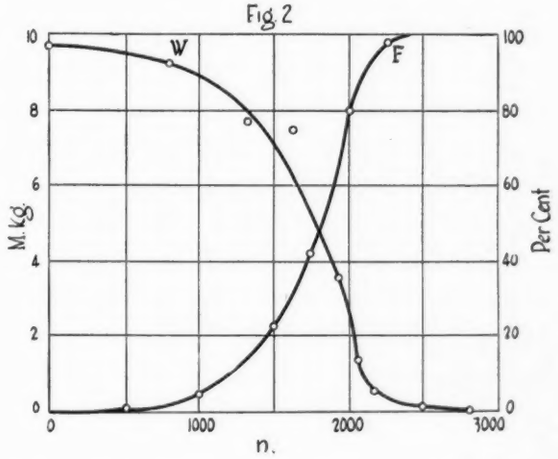
static and dynamic tests by saying that in the former isothermal conditions obtain, while in the latter we have an adiabatic process. Dr. Honda does not believe in this explanation, saying that even if the static test is carried out very slowly there is a considerable temperature rise, hence the process is by no means isothermal.

If the notched bar specimen always breaks at a certain definite angle, then the energy required should be independent of the impact velocity of the hammer. For the pressure exerted on the test piece, being the change of momentum of the hammer, must be nearly equal to the reaction of it, so long as the test piece remains unbroken. This conclusion has been confirmed by Charpy and Cornu-Thenard, whose results were published in *Engineering*, 1907, Vol. CIV, page 346. Tests made at the Sendai Institute, which were carried out on specimens containing 0.1, 0.5 and 0.9 per cent of carbon, further confirmed this result.

Accumulation of Energy

In repeated impact tests the energy given to the test piece each time is very small, but the accumulation finally breaks the test piece. At the beginning of the impact, part of the energy is dissipated as heat and sound and part is returned to the hammer, the consequence being that only a small fraction of the energy of impact remains in the specimen as potential energy of strain. As the test is continued, the energy of strain

Fig. 2



gradually accumulates in the test piece, until a number of small fissures, formed in the interior, cause the specimen to break. If the energy of impact is sufficiently small, part of it is given back to the hammer and all of the rest is transformed into heat, none being left in the specimen in the form of potential energy of strain. In that case the specimen will not be broken, however many times the impact is repeated. This corresponds to the endurance limit.

To measure the degree of fatigue in repeated impact tests, the following method seems to be most convenient. A number of test-pieces of the same dimensions were made of the same material and each treated thermally in the same way. Before beginning the repeated impacts, the absorbed energy W_0 is measured by a Charpy machine; then a certain number of repeated impacts are applied to another test-piece; then it is taken out from the machine and the energy W required to break it by a single impact is measured, and so forth. Then the degree of fatigue is defined by the following expression:

$$F = \frac{W_0 - W}{W_0}$$

If expressed in percentages, the 100 per cent indicates that no energy is required for breaking and the fatigue is complete. The relation between F and the number of impacts n is given by a curve shown in Fig. 2. The material here used was an annealed 0.3 per cent carbon steel and the dimensions of the test specimen are given in Fig. 1. In this impact test the hammer weighed 4.25 kg., the height of fall was 3 cm. In the case of the single impact test, 68 mm. of the central portion of the test specimen were cut off, and the distance between the two supports of the Charpy machine was 54 mm. In practice, it is not convenient to break the test-piece during the course of the repeated impacts to determine the degree of fatigue, but this quantity can be found indirectly by measuring some other physical properties. For instance, if we find the relation between the number of repeated impacts and the electrical conductivity or magnetization, and also study the relation between the latter and F, we can find from the measurement of electric conductivity or magnetization with respect to the number of impacts, the degree of fatigue due to the repeated impacts.

Florida as a Rubber Field

NEW impetus has been given to the movement toward American produced rubber by the discovery in Florida of a Para rubber tree which has stood in the open for 25 years at least, and has successfully withstood conditions which heretofore have been considered deadly to the species.

The Para rubber tree, or *Hevea brasiliensis*, is the principal rubber producing tree and is the species which is cultivated extensively in the East Indies. From the fact that it is confined by nature to the forests of the Amazon valley of Brazil it has been considered a strictly tropical tree which would not grow more than 10 to 15 deg. from the Equator.

In a recent bulletin from the Department of Agriculture relating to the discovery of the tree, it was pointed out that while the survival of a single tree does not necessarily mean that commercial production in this locality is possible, it does mean that considerable experimentation will be necessary in order to determine whether large areas under American control or influence cannot be utilized in this way.

The department suggests that private experiments may be carried on for this purpose and signifies its willingness to aid such work in any way possible.

H. H. Rice

Automotive Outlook in Europe ENCOURAGING

All countries are pushing road development and motor market is steadily expanding.

By H. H. Rice

Member, American Delegation, Fifth International Road Congress

DESPITE all the major financial difficulties in which Europe as a whole has been involved since the war, underlying economic conditions are showing a slow but steady improvement and the outlook for a steady expansion of motor transportation is a most encouraging one.

Summaries of fact furnished members of the American delegation to the Fifth International Road Congress during their survey of highway and traffic conditions in 10 countries furnish conclusive evidence that everywhere in Europe there is a growing recognition of the vehicle as an element in transportation. Even in those countries most seriously affected by the war, every year sees an accretion in the motor vehicles in service and it is a notable fact that the passenger car is coming to be regarded more and more as part of the everyday equipment of the average business man.

Basically, the chief obstacles to a more widespread use of the car have been lack of modern highways, high tariffs and high operating costs.

With respect to highway development, while fiscal experts look askance at projects destined to relieve a growing congestion and to broaden the field of motor use, on the ground that treasuries can't stand the expense, the fact remains that the job of reconditioning European roads is under way.

That the work will proceed at an accelerated rate is a corollary which may be stated definitely out of American experience.

All of us can remember without difficulty the day when a prophecy that we would shortly be expending $1,000,000,000 annually for highway improvement would have been met with a polite shrug. Yet, the pressure of motor vehicle expansion has not only brought that result about, but at the same time so increased our wealth as to make the improvement pay for itself several times over.

What the United States has done, the countries of Europe are destined to do.

The great difference between the road problem there and here is that most of the countries of Europe can get the results which we have attained, more rapidly and at a far lower cost than has been possible in the United States.

The reason is that the national highway systems of practically all the countries save Belgium, Norway and Sweden are heritages from past centuries when railroad development was as yet unknown.

More than 100 years ago great military roads of depths and arrow-like directness which would be impossible of general accomplishment today, save at prohibitive costs, were laid out and constructed by the absolute rulers of the time.

Those roads have survived and were it not for the World War, would probably be thoroughly modern today. As it is, they have fallen into disrepair and, in consequence, great programs of maintenance and resurfacing must be put under way to bring them back to serviceable conditions. Beyond this, all that is needed is an occasional widening and the building of feeder highways.

In France and Germany these improvements are already well under way, and in all of the countries experimental highways have been laid and the work of rehabilitating these major systems begun.

Denmark's highways have been maintained and consequently the system there is one of the most adequate in all Europe.

Norway and Sweden, while not participants in the war, did not have the ancient roads to build upon and, consequently, are faced with the need for a modernization of roads which, on account of the topography, are narrow, full of twists and turns and unsuited to all-the-year-around use. Both of these countries are proceeding along the road to improvement.

Italy's need is the upbuilding of a system of modern roads and Mussolini pledged his country to the task while speaking to the road delegates at Rome.

England's problem must be stated separately. The increase in motor use has been a rapid one, compli-

cated by the extensive use of steam lorries and steel tired vehicles. The island is criss-crossed by roads built many years ago and for uses of horse-drawn traffic. Practically all of the adjoining property is held by individuals who resist encroachments. Consequently the problem is one of trying to maintain existing roads and traffic at one and the same time.

In the main England's system, while still requiring many major developments which will cost hundreds of millions of pounds, does enable the motorist to get around.

In those countries which manufacture motor vehicles there appears to be little prospect of immediate decrease of moment in tariffs. In fact, the trend is, if anything, in the opposite direction as Great Britain, France and Italy, at least, seem intent upon securing as much of the home market for their cars as possible, even though in doing so they severely penalize their own transportation facilities and consequently the ultimate consumer.

In Germany the tariffs are still high and the German industry is bending its efforts toward greater production. In Czechoslovakia the permit system is still in force but the demand for more and more cars is an insistent one. Belgium's tariffs will no doubt be maintained for a considerable time as part of the general scheme for financial rehabilitation and probably the same course will continue in the smaller countries of central Europe. There is some talk of increases in Sweden due to proposals for motor vehicle manufacture there.

The high-powered American car with its greater flexibility continues to have a strong hold upon the users in all countries where the tariffs are not prohibitive and in the Scandinavian countries, particularly, we found as much as 90 per cent of the registration was of our products.

Turning to the proceedings of the Road Congress at Milan. The Congress was attended by delegates from 52 countries, which is *prima facie* evidence of the world-wide interest in highway transportation.

The sessions provided a valuable interchange of viewpoints on the engineering phases but were disappointing in that the economic viewpoint generally emphasized here occupied rather a minor position. This, however, is easily understandable in the light of the fact that many countries are only just now coming to the conception of the vehicle as an instrument in transportation rather than as a luxury.

John Mackall of Maryland, Paul Sargent of Maine, and Chief MacDonald of the U. S. Bureau of Public Roads, presented the American views at the sessions, the other members of the delegation, who were not engineers, taking the opportunity to meet many bankers, economists and others interested in transportation.

During the tour of inspection made by the American delegates following the Congress, they traveled almost 5000 miles. In every city visited, tours of inspection were made and conferences held with leading public and civic officials.

Out of these meetings came a better understanding on our part of European problems, and a new and valuable contact with leading highway officials everywhere that cannot but make for closer relations in the future. The press everywhere devoted much space to the activities of the delegation.

In closing, I cannot forbear a special word of appreciation for the work of Chief MacDonald, who was chairman of the delegation.

In all of our sessions, both at Milan and elsewhere, Mr. MacDonald met the questions asked him clearly and squarely. Talking on finance, he did not hesitate to recommend lower taxes where levies had been established which he felt could only result in diminished returns to the government. With respect to policies of construction, of types of roads and of maintenance, he reminded his auditors that a large maintenance mileage is the first requisite and that the objective should be one of service. On matters of administration he called attention to the need for centralized control.

As a result of his frank advice and his unsparing willingness to devote himself to the work at hand, he established many strong friendships for himself and the delegation and did much to add to the respect which most of his auditors already had for him through a perusal of his writings on highway transport.

Taken in their entirety, both the adherence of our Government to the Congress and the tour which followed were distinct contributions to the furtherance of sound world highway policies which cannot but be of real influence in our future relations.

THE Norwegian Aeronautical Association at present is endeavoring to establish an air service between Norway and England. According to the plans, which have been thoroughly worked out, the new line will lead either from Oslo to Kiel, following the eastern coast of Jutland, then follow the coast of Holland and finally cross the North Sea, terminating at Harwich; or from Oslo to Christiansand, whence it will follow the west coast of Jutland, the latter part of the line being the same as that of the alternate plan.

IN the accompanying article, Mr. Rice, vice-president, General Motors Corp., gives his impressions of European conditions, with reference to automotive and highway development, as gleaned during his recent trip abroad with the official American delegation to the Fifth International Road Congress.

Mr. Rice, with the other members of the delegation, took part in the sessions of the Congress at Milan and Rome, Sept. 6-13, and later traveled through Austria, Germany, Czechoslovakia, Sweden, Denmark, Holland, Belgium, France and England.

At each point they surveyed many roads and held numerous conferences with leading government officials, including cabinet members, highway directors and others interested in highway development and in transportation generally.

Those in the delegation were: T. H. MacDonald, chief, U. S. Bureau of Public Roads; John N. Mackall, chairman, Maryland Road Commission; Paul D. Sargent, chief engineer, Maine; Mr. Rice and Pyke Johnson, representing the National Automobile Chamber of Commerce; H. H. Kelly and H. C. MacLean, Department of Commerce.

THE FORUM

Use of *Speed Governors* is Defended as Highway Safety *Measure*

New regulation in South Carolina requiring buses to be so equipped is viewed as step toward accident prevention.

Editor, AUTOMOTIVE INDUSTRIES:

Practically all automotive engineers recommend that a gasoline engine be equipped with a governor for the protection of the engine, but little thought has been given to the speed governor as a possible solution to the numerous traffic accidents. Therefore, the question which has arisen and which has been placed before the public by W. W. Wells in a previous issue of *Automotive Industries,* is, Will the use of governors on buses, as required by the new regulation in South Carolina, reduce the number of accidents on the highways?

I am not an authority on this subject, but I have made a study of the use of governors on commercial as well as private cars. Here is the situation as I see it:

A study of accidents shows that most of our fatal accidents are caused from overspeeding. For example, take a recent accident in which 12 were killed and several injured when a bus upset while trying to make a curve in the road. The report was that the driver saw the danger, but due to the high speed and unfavorable conditions was unable to control the bus. If this bus had been equipped with a speed governor it would no doubt have made the curve; if the speed of the bus had been limited the driver would have had more time after he had realized the danger.

The problem which the drivers of today are confronted with, and which accidents show they are unable to solve, is to determine when conditions are favorable for driving at a speed of from 40 to 50 m.p.h. This is not only true with commercial vehicles but with private cars as well. With these prevailing conditions, apparently, the speed governor is the most logical solution to the accident problem.

The use of a governor does not compel one to stay behind the slowest driver unless the so-called "slowest driver" is traveling at a speed greater than the speed for which the governor is set. A governor which serves its purpose properly will not affect the acceleration of a car until it is close to the governed speed. This will allow the vehicle to pass a slower one just the same as if no governor was being used. Furthermore, if a car which is governed at 35 m.p.h. should overtake another one running at 32 m.p.h. the driver of the rear car would not be deceived by the possibility of being able to pass the front car, but on the other hand he would know that his maximum speed is 35 m.p.h. and would take no chance in passing until the road was open.

South Carolina is not trying to prevent a driver from passing the slowest car on the road, but to prevent one driver from passing another when the one which is being passed is traveling at a dangerous speed. The speed governor appears to be the best and only practical solution to this problem and I expect to see the other States follow the example set by South Carolina.

J. T. BROCK,
K. P. Products Co., Inc.

Loss of Alcohol from Radiators

Editor, AUTOMOTIVE INDUSTRIES:

The public is beginning to realize that an engine operated with a reasonably high jacket temperature in cold weather has superior performance and is free from some of the troubles which are common to motors operated with low jacket temperatures. In fact the demand has been so persistent in the past few months that some of the popular makes of cars have resurrected the choke type of thermostat control which has been in use more or less for many years and are featuring it as one of their outstanding improvements.

The number of cars which will be equipped with some form of temperature control this year will far outnumber those thus equipped last year. Production schedules would indicate that there will be manufactured and marketed within the next few months close to three-quarters of a million cars using some device for increasing the temperature of the liquid. The designers, however, have given little thought to preventing the alcohol from separating from the water. In the type of systems which will be extensively marketed there will be no means provided for preventing the alcohol from separating from the water. It is a matter of wonder that such an important point should be overlooked in view of the comparatively simple and inexpensive design needed to prevent the alcohol from separating from the water at any temperature up to and including the boiling temperature of the liquid.

The opinion which seems to prevail is that a mixture of alcohol and water cannot be successfully used at jacket temperatures sufficiently high to insure satisfactory operation in cold weather without the alcohol being separated from the water. This is a false impression, as there is not the slightest difficulty, without entering into any complications or without materially increasing the cost of production, in designing a radiator which will handle a mixture of alcohol and water in cold weather at any temperature up to and including the boiling temperature of the liquid in the jacket of the motor without the alcohol being separated from the water and without using any auxiliary devices.

W. W. MUIR.

(Editor's Note—Mr. Muir evidently refers to the evaporative cooling system, which is or can be completely closed, so that no vapor can escape to the atmosphere.)

Protests Against Wider Tread

Editor, AUTOMOTIVE INDUSTRIES:

In your editorials of Sept. 30 in *Automotive Industries* you have one on "Non-Standard Rear Treads." As a driver and user of the road, I am very much discommoded, annoyed and often scared by the big buses and trucks. These vehicles all have an increased width of tread over the standard and therefore occupy a much increased width of the road.

There is considerable talk about increasing our road width so as to accommodate three or four and more cars abreast. Increase of tread width will inevitably be used to increase the maximum width of body and we should not encourage cars which will occupy more than their share of road width.

The bus of today is very comfortable for the passengers but most uncomfortable for the other fellow.

Personally, I do not advocate increased tread for passenger vehicles on account of the complications above indicated.

JOHN R. CAUTLEY,
Bendix Brake Co.

Brake Torque Equalization

Editor, AUTOMOTIVE INDUSTRIES:

In the Oct. 14 issue of *Automotive Industries,* page 660, H. Copleston in commenting on brakes and brake equation makes the statement that "The added complication of pressure controlling devices for *torque variation* is not a necessity, as uniformity of braking action can be obtained and maintained over a considerable period of time with the present construction."

It is assumed that Mr. Copleston means *torque equalization* and not *torque variation.* As to the possibility of maintaining uniform brake action over a considerable period with present construction, the writer has proven beyond all doubt, with the use of a recording instrument, the fact that uniform brake action cannot be assured even for a day's run.

But even granting Mr. Copleston's statement in this case to be correct, there remains the varying action of the tire on the road surface which present construction does not control in any way. With present types of brakes perfectly adjusted, the car may skid as a result of frictional inequalities in the road surface. With torque equalized brakes this danger is eliminated. Just what the elimination of this danger means can be seen from reports of accidents in New York State for the period from Jan. 1, 1925 to July 1, 1925.

Defective brakes, accidents 474, resulting in 37 fatalities.

Skidding accidents 1304, resulting in 38 fatalities.

These fatalities were the highest reported for any machinery defect, showing that brakes as at present designed are not up to the standard of other mechanical parts of the car. Similar reports for the first six months of 1926 would appear to indicate no marked improvement in brake design and are as follows:

Defective brakes, accidents 321, fatalities 21.

Skidding accidents 853, fatalities 25.

Against the inference that the added complication of torque equalization is not necessary (which complication, by the way, might amount to as much as a few cents additional cost per axle), the writer wishes to balance the saving of at least one life out of the 38 sacrificed annually to uphold the contention of conservative engineers that torque equalization is not warranted by the extra cost and complication, and to assure the skeptical ones that not only one, but practically all of these 38 lives, will be saved by the adoption of this principle.

GEORGE L. SMITH.

Adjustable Chrysler Seat

A SPECIAL feature of the new Chrysler "70" sport phaeton, which was introduced several weeks ago, is the adjustable front seat. In addition to the whole seat moving forward or backward as desired, to suit the individual requirements of the driver, the backrest also is adjustable and may be tilted at various angles by loosening or tightening leather straps, one of which shows in the picture above

OWING to the great density of traffic in Paris it is of the utmost importance that the pavements laid down in the city should be non-skidding in all kinds of weather. Consequently, every conceivable type of road surface is being experimented with. In front of the Madeleine the square has been laid with a surface of asphalt mixed with hard gravel over a bed of ordinary asphalt. Some streets are paved with hard bricks, offering a rough surface. More streets are being laid experimentally with concrete, and all kinds of stone blocks are employed, the best result being obtained so far for ordinary motor traffic with small granite blocks laid fanwise. It permits of the old granite blocks being broken down and utilized, but it is nevertheless expensive. Each contractor has to maintain the roads allotted to him for a period of 15 years on payment of a fixed annual sum.

Specific Output of Foreign Engines Not Higher Than Ours

Study of available data shows, in fact, that European makers do not get as much out of their engines per unit of displacement as some American manufacturers.

By P. M. Heldt

IN discussing modern high speed engines, European writers frequently use the term "high efficiency" engines. This, of course, is a misnomer, for the fact which it is intended to emphasize is that the particular engines deliver a high output in proportion to their piston displacement. Considerable effort has been made in Europe in recent years to increase the specific output so as to make it possible to use engines of reduced cylinder dimensions and which therefore have a low Treasury rating (as the term is used in England).

American engineers sometimes have expressed curiosity as to just what output European manufacturers get from their stock engines of recent manufacture. This is a rather moot point, for European makers practically never issue horsepower curves and it is comparatively rare that even a lengthy and detailed description of a new car is accompanied by any data on engine performance. Data are lacking particularly with respect to French engines. Whether it is considerations of competition that prevent makers from touching on this subject or whether they feel that public statements showing their engines to develop from three to five times the official tax ratings of their cars might have a bad influence on the fiscal authorities, is a question which cannot be answered offhand.

Nevertheless, data regarding the maximum horsepowers of about a score of modern European cars are at hand, and when the figures are reduced to the basis of brake mean effective pressure they show wide variations. In making use of the term modern in the above statement, what is meant is that the engines referred to are now in production. It may be that some of these engines were designed several years back and are not truly representative of the latest practice.

Table I—Four-Cylinder Engines

Number	Piston Displacement Cubic Inches	Piston Speed Ft. p. Min.	B. M. E. P. Lbs. p Sq. In.
1	62	1535	78.5
2	64.2	1965	91
3	78.5	2135	99.5
4	80	2000	66.5
5	86.6	2170	92
6	86.7	2020	78.5
7	91.5	1730	86.5
8	91.5	2620	82
9	100	1800	77
10	100	2160	104
11	119	3140	118.5
12	159	2040	76.5
13	159	2500	83.5
14	159	2560	99
Average		2170	88

Table II—Six-Cylinder Engines.

1	121.5	2430	106
2	159.2	2325	83.5
3	204	2100	79
4	325	2300	78

Airplane and Automobile Engines

From aircraft engine practice we know that it is possible to get materially higher brake mean effective pressures than we normally obtain in automobile engines. There are a number of differences in the operating conditions of the two types of engine which account for this difference in performance.

Aircraft engines are designed for operation on high test gasoline or on fuels even better from an antidetonation point of view, hence the use of a higher compression ratio is warranted. Then, silent operation is not a consideration, and some of the restrictions on the lift of valves and on their opening and closing charactertistics are removed. Aircraft engines, moreover, generally operate without a muffler, hence there is no back pressure to the exhaust, and the charge does not have to be preheated, or passed through an air cleaner, which, in connection with the greater valve capacity, ensures a higher volumetric efficiency.

As a typical representative of the modern European small bore engine we have an Italian design—a four-cylinder engine of 64 mm. bore and 100 mm. stroke, which develops 27 hp. at 2750 r.p.m. and 32 hp. at 3250 r.p.m. This engine has a displacement of 1287 cu. cm. or 78.5 cu. in., and making use of the equation

$$\eta p = \frac{792{,}000\ hp}{n\ D},$$

where ηp is the brake mean effective pressure; hp, the brake horsepower; n, the speed in revolutions per minute and D the piston displacement in cubic inches, we find that ηp is 99 lb. p. sq. in. at 2750 r.p.m. and 99.5 lb. p. sq. in. at 3250 r.p.m. That the b.m.e.p. should be

greater at the higher speed is rather puzzling and would indicate that this is not the peak of the load curve.

One British engine of proprietary make has four cylinders of 72 mm. bore by 120 mm. stroke and is rated at 60 hp. at 4000 r.p.m. This engine has a piston displacement of 1954 cu. cm. or 119 cu. in. and the brake mean effective pressure by the above formula figures out to 118.5 lb. p. sq. in.

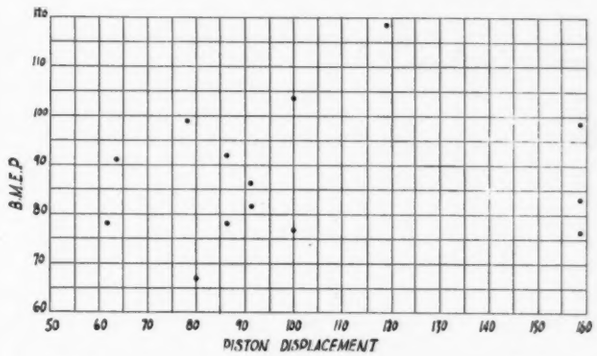
Another Italian engine of recent design has six cylinders of 65 mm. bore and 100 mm. stroke and develops 60 hp. at 3700 r.p.m. Its piston displacement is 1991 cu. cm. or 121.5 cu. in. The b.m.e.p. figures out to 106 lb. p. sq. in.

An Austrian six-cylinder engine of 71 mm. bore and 110 mm. stroke develops 45 hp. at 2000 and 54 hp. at 3220 r.p.m. The piston displacement of this engine is 2610 cu. cm. or 159.2 cu. in. The b.m.e.p. is 111 lb. p. sq. in. at 2000 r.p.m. and 83.5 lb. at 3220 r.p.m.

A small four-cylinder Austrian engine of 61.5 mm. bore and 88 mm. stroke develops 30 hp. at 3000 r.p.m., thus showing a b.m.e.p. of 86.5 lb. p. sq. in.

Data are also available for about half a dozen German engines, and several British, and in the tables, for four and six-cylinder engines respectively, both the piston speed of maximum output and the corresponding b.m.e.p. are given, the engines in each class being arranged in order of displacement.

In Fig. 1 the b.m.e.p. is plotted against the piston displacement and if we neglect the highest and the lowest values of the b.m.e.p. (extremes are always likely to be unreliable) it will be seen that there is no noticeable variation of the b.m.e.p. with the displacement, that is, with the size of cylinder. The average b.m.e.p. for the 14 four-cylinder engines figures



Piston speed—mean effective pressure relation of modern European engines

out to 88 lb. p. sq. in., which is about the same as is obtained from American engines of modern design. The average piston speed of the four-cylinder engines is 2170 ft. p. m., which is considerably more than the average of American four-cylinder engines but less than that of our average six-cylinder engines of recent design. The averages for the six-cylinder cars are substantially the same as for the four-cylinder.

Thus it would seem that European manufacturers do not get as much out of their engines per unit of displacement as American manufacturers of six-cylinder engines of recent design.

Tensile Tests Made With Aluminum-Silicon Alloys

RESULTS obtained in tensile tests on test specimens of Alpax (an aluminum-silicon alloy) were published recently in a report of the British Aeronautical Research Committee, the tests having been carried out by H. J. Tapsell for the Engineering Research Board of the Department of Scientific and Industrial Research. The test bars were 1⅛, 2 and 3 in. in diameter and were supplied by Lightalloys, Ltd. of London.

According to a review of the report in *Engineering*, the specimens were first subjected to chemical analysis and were found to contain 12.7 per cent of silicon, an average of 0.55 per cent of iron, and small percentages of calcium and of sodium varying from 0.01 per cent to 0.07 per cent, and 0.006 per cent to 0.011 per cent respectively. The specimens were sectioned and polished and were found to be in the modified condition; moreover, they appeared to be free from unsoundness. The chill-cast material gave in the as-cast condition, at room temperatures, ultimate strength values of 31,000 and 32,000 lb. per sq. in., and elongation values, on 2 in., of 10 per cent. and 10.5 per cent. Sand-cast specimens gave ultimate strength values of well over 27,000 lb. per sq. in., and elongation figures of between 7.5 and 10 per cent.

The conclusion arrived at by the investigator is that Alpax is a valuable casting alloy; the ultimate tensile strength compares favorably with that of chill-cast Y alloy, and the elongation is unusually high for a cast aluminum alloy. The tensile strength was found, however, to fall rapidly with rise of temperature. At 250 deg. C. the chill-cast material gave an ultimate stress value of 5650 lb. and an elongation of 9 per cent; at 350 deg. C. the results of two tests were: ultimate stress, 9000 and 10,000 lb. per sq. in., and elongation, 19 and 25 per cent, respectively. It is pointed out that, at 350 deg. C., Y alloy, in the as-cast condition, has a tensile strength of 5650 lb. per sq. in.; in the cast heat-treated condition, the ultimate strength value of the alloy is nearly 27,000 lb. The Alpax specimen bars were found to be not wholly free from casting defects, and, in this respect, the 1⅛-in. chill-cast bars were the least satisfactory; a number of them contained large cavities. On the other hand, the sand-cast bars were quite sound; the 2-in. and 3-in. diameter specimens were also satisfactory, on the whole.

Fatigue tests were carried out by means of the Haigh alternating-stress testing machine, under reversed direct stresses, and on a 10×10^6 reversal basis. Tests were made at room temperatures and at 180 deg. C. The estimated limiting fatigue range of chill-cast 1⅛-in. bars, in the as-cast condition, was ∓8500 lb. p. sq. in., at room temperature. The corresponding figure for sand-cast bars of the same dimensions was ∓10,000 lb. p. sq. in. At 180 deg. C., the value for chill-cast 1⅛-in. bars in the as-cast condition was ∓6300 lb. p. sq. in. Although better results have been obtained from some of the heat-treated alloys of aluminum, the fatigue range of the cast-Alpax specimens, as revealed by the tests, is considered to be good.

Books for the Business Bookshelf

A Study of Car Design

The Elements of Motor Vehicle Design. C. T. Donkin. Oxford University Press, London. 277 pp. Illus. 12s 6d.

THIS book makes a welcome addition to publications upon a subject which has received almost too little attention heretofore. It is intended for use by designers, draftsmen and students so that the subject is developed from first principles to show the problems under consideration and the application to them of the fundamental laws of mechanics and geometry. Because of the frequent changes in detail design of cars, little effort has been made to show examples of present standard practice but rather the basic principles of the design have been emphasized. The book is written with the understanding that the reader has an elementary knowledge of mechanics, of practical mathematics and of the mechanism of the car. The author has prepared two graphs in the chapter on steering gears for determining the proper angle of the cross arm with the axle which he believes to be original and which great simplify the determination of the most suitable angle for various angles of lock.

Most of the problems and worked examples used throughout the book have been based upon the same car and a list of leading dimensions and particulars of this car is given for the reader's convenience.

Science in Industry

What Price Progress? Hugh Farrell. G. P. Putnam's Sons, New York. 323 pp. $1.

THIS is another one of the several volumes which have been published recently giving in non-technical language the results, hopes and despairs of the country's scientists and inventors in their attempt to maintain the nation's present position in the economic organization of the world, or to improve it.

The major theme which the author is striving to get across to his readers is that research pays not only the country as a whole but the industry which fosters it. In the rapid advancement of mechanical and chemical processes he finds no difficulty in obtaining many interesting examples of how a close liaison between industry and science has proved highly profitable to both. The book is written in an interesting manner and if too many works on the same subject have not already been read it should be worth a few hours of anyone's time.

Lessons in Budgeting

Applied Budgeting. Henry Bruere and Arthur Lazarus. A. W. Shaw Co., Chicago. 248 pp. Illus. $7.50.

SINCE business budgeting became a subject of considerable interest there has been published a great deal of material treating with its general aspects. But, as in many other fields, it often appears to be much more difficult to apply these general principles to a specific problem than it is to obtain a comprehensive knowledge of the fundamentals. Unfortunately, perhaps, for the progress of budgeting, it has been a real problem to obtain specific example of application so that little, if any, material has been published previously to show this very practical side of the subject.

In the present book application methods are shown for a number of important industries including oil companies, railroads, banks, metal working establishments, contracting and constructing companies, etc. It is unfortunate for our readers that the automotive industry did not receive similar treatment, but in spite of this no one can study the examples given without obtaining a very valuable insight into application methods which will prove effective in his own work regardless of its nature.

Settling Business Quarrels

Arbitration and Business Ethics. Clarence F. Birdseye. D. Appleton & Co., New York. 305 pp. $2.50.

ARBITRATION as a method of settling business disputes of various kinds and between many different types of organizations and individuals has, in recent years, gained greatly in favor over the pugnacious and inefficient methods which had been in general use previously.

In this book the author emphasizes the fact that although many persons, and especially lawyers, look upon common law arbitration as the chief variety, there are, in reality, four distinct types of arbitration of which commercial arbitration, or the machinery provided by an organized trade association to regulate the technical and ethical conduct of its members, is by far the most important in spite of the fact that it has been little used so far.

Common law arbitration has become almost obsolete, its particular field having been taken over by statutory arbitration. The fourth type of arbitration is not strictly arbitration, according to the author, but collective bargaining. He considers it an effective method of avoiding disputes, present and future.

Another Tome on Selling

Salesmanship Applied. Paul W. Ivey. A. W. Shaw Co., Chicago. 333 pp. $5.

THE books on the general subject of selling methods are almost without number. Many of them are full of valuable and practical information but one is justified in wondering sometimes just what reason an author may have for adding another volume to the series since the fundamental principles of all of them are identical. Mr. Ivey's book seems to be justified on the ground that it is written in a more entertaining manner than most books of this character. A conversational method is used throughout, bits of humor are scattered across the pages and experiences from the author's 25 years of selling are generally used to make points, rather than academic discussions.

"Know your product, know yourself, know your customer," are the basic ideas behind Mr. Ivey's treatment of the subject just as they are in nearly all similar books. This volume will probably appeal to the average working salesman, however, somewhat more than other books containing many of the same ideas but not so forcibly expressed.

EDITORIAL

National Distribution

NATIONAL advertising is generally believed and expected to lead to national distribution. That this may not always prove true, in the automotive industry at least, is indicated by an analysis of 1925 sales figures as compiled by a well-known statistical agency.

According to data from this source, of 37 makes of cars—those with the highest production and all nationally advertised—only 19, or half, sold more than five cars in every State in the country during 1925, and only 27 made at least one sale in every State. In but eight States were more than five of each of these 37 makes of cars sold and in but 24 States was at least one of each make sold.

Although the data upon which this analysis is based may not be absolutely correct they undoubtedly are near enough to make these returns qualitatively if not quantitatively accurate. Sales of five cars or less in an entire State can hardly be termed successful distribution for that territory, so it would appear that only about half the cars which were nationally advertised during 1925 obtained the expected result of national distribution.

High price of cars and low purchasing power of the residents of particular States can not be the reason for this record since cars selling for as little as $1000 failed to make any sales or not more than five in States where some of the highest priced makes were sold in reasonable quantities.

Whatever the reason, it seems evident that some manufacturers, at least, failed to cash in fully on the national advertising campaigns which they conducted. When nationally advertised cars fail to make more than five sales in from one to over 30 States it may be time to give very careful consideration to the effectiveness of present merchandizing policies.

This information applies to 1925. It will be interesting to compare similar data for 1926 to determine if more or less effective effort is being applied toward turning the advertising campaigns into definite sales effects.

Service Equipment at the Shows

LAST year service equipment first began to play a part in the automobile shows. This year its part is going to be increased measurably. Not only are shop equipment exhibits to be held for the first time in connection with the two National Shows in New York and Chicago, but also similar exhibits will be staged in a greater number of local shows than ever before.

At the present time shop equipment exhibitions emphasizing the growing importance of the service end of the business are certain to be held in Baltimore, Philadelphia, Cleveland, Detroit, Cincinnati, St. Louis, Milwaukee and Montreal, while divisions of the same kind seem likely to be found as well in connection with the automobile shows in San Francisco, Los Angeles, Kansas City and Indianapolis.

Primarily, of course, the purpose of these special exhibits will be to help shop equipment manufacturers sell more products, but they have in reality a greater significance. Their inclusion with the various automobile shows tends to recognize the service branch of the industry as being on a plane of importance with that of designing and selling. Their presence indicates that service has just about emerged entirely from the ugly duckling stage and that it is no longer likely to be treated so much like an unwanted step-child of the industry as in the past.

Public Sentiment Rules

AMONG the views submitted by the Bus Division of the A.A.A. to the Interstate Commerce Commission is the belief that bus transportation is an industry by itself and should be regulated without regard for existing carriers. With this opinion rail interests disagree. They say that to operate buses on routes already served by other means is unnecessary duplication of service which results in an economic loss to the community. One spokesman for the traction industry believes that such an installation is justified only when the rail line has been definitely proved unprofitable.

In arriving at this viewpoint, has not one very important factor in the situation been neglected—the desires of the riding public? The public pays all transportation costs and so should have some voice—a strong one—in determining what service it will be furnished. If there is a strong preference for bus transportation by the public, has any agency justification for withholding it for purely economic reasons?

What may be expected to happen if this is done is shown by the experience of London. London prefers bus transportation to underground railways and in spite of the pronounced favoritism shown the latter by the city officials in the way of fares, taxes, etc., the Londoners ride buses and no doubt will continue to do so in spite of all obstacles.

The futility of trying to change the public's habits and desires by official regulation has been evidenced time and time again. If the people prefer bus transportation they are likely to get it in spite of all obstacles and with little regard for what happens to other carriers. Regulation and other legal obstacles may delay the final solution but they can not alter the fact that the public usually gets what it wants.

AUTOMOTIVE NEWS SECTION INDUSTRIES

Philadelphia, Pennsylvania

Thursday, November 11, 1926

Increased Dealer Stocks Reduce Factory Operations

PHILADELPHIA, Nov. 11—With a majority of the automotive plants on a four or five-day week basis, the industry is marking time, with interest concentrated on the forthcoming national shows and the opening of the 1927 season. Dealers in most lines are comfortably stocked with new cars and production for at least two months will be almost entirely to meet current market requirements.

Sales are somewhat irregular, and are below the level of a year ago, but this condition is readily explained by the slowness of business in the South and Middle West. The decline has not attained the proportions of a slump, and the men in the industry are confident that the locally adverse influences will be overcome in the early months of next year. Sentiment on the whole is cheerful.

With car and truck production in October estimated at 368,000 units, the total for the year to date has been brought to over 4,000,000 vehicles, against 4,336,000 for the entire year 1925, which marked a new record for the industry. There is now little doubt that the 1926 total will be over 4,500,000 cars and trucks.

This major gain has been almost entirely in the domestic market. Foreign sales will exceed by only a few thousand the mark of 537,000 cars and trucks established in 1925. Selling difficulties that have developed or been accentuated in Europe, however, will, it is believed, be counterbalanced by gains in other markets. Expansion of some of the leading export companies is being carried on regularly.

The conviction is growing that motor car prices will remain on substantially the present level for some months to come. There is little disposition to make changes while the market is experiencing its seasonal lull and is therefore little responsive to price influences.

Pratt & Whitney Receive $2,000,000 Navy Contract

HARTFORD, CONN., Nov. 9—Pratt & Whitney Aircraft Co. has been awarded a $2,000,000 contract by the United States government for approximately 200 of the company's newly developed air-cooled Wasp engines and for spare parts for the navy department. The order will keep the engine shops busy throughout 1927, it is stated. Over 200 men are now engaged in the work.

It is also stated that Ford Motor Co. recently received a Wasp type engine and is trying it out on the Detroit-Chicago route.

$750,000 Sales Plan Favored by A.E.A.

Association Would Spend $250,000 Annually—Name Hennecke President

CHICAGO, Nov. 10—The Automotive Equipment Association, composed of some 600 jobbers and manufacturers of accessories, replacement parts, shop equipment and other automotive supplies, is expected to commit itself to a marketing development program calling for the expenditure of $250,000 annually for three years, at its convention now being held at the Coliseum here. The annual business exposition of the association also is in progress.

Action favoring the marketing program has been taken and details are expected to be completed later in the week. The plan in general will provide for the securing of a competent merchandising leader and the setting up of the necessary machinery to help educate the 100,000 dealers and independent repair shops of the United States in more effective merchandising. It is expected that the $200,000 additional funds necessary for the project will be obtained through an assessment plan, the details of which are to be decided at later sessions.

Earl V. Hennecke, vice-president of the Moto Meter Co., Inc., was chosen president of the A. E. A. for 1927 at the election held yesterday. Arthur C. Storz, head of the Storz-Western Auto Supply Co., Omaha, was elected vice-president.

Regarded as Best Meeting

With a business exhibition larger and more comprehensive than ever before, a large attendance, and a membership more solidly behind a movement for greater and more constructive merchandising effort than ever before, the present A. E. A. meeting is looked upon as the best in the 11 years of the organization. A novel departure this year was the Dealers' Night which attracted several thousand.

G.M. ADDS $4 EXTRA TO 1926 DIVIDENDS

NEW YORK, Nov. 11—Declaration of a $4 extra dividend on the common stock was today the answer of the directors of General Motors Corp. to Wall Street reports of a slump in the automobile business.

Together with the regular dividends, also declared at the meeting, the extra will call for payment to stockholders of over $34,000,000, and this, says President Alfred P. Sloan, Jr., is the "best possible evidence as to not only the general position of the corporation from the standpoint of current business and its financial position, but also expresses the confidence of the directors as to the future."

Holders of General Motors common stock through 1926 will have received $20.50 in cash, including payments on the 50 per cent stock dividend distributed Sept. 11. Total sales of the corporation for the year will be over $1,000,000,000.

Quarter Tire Sales Reach $269,317,000

NEW YORK, Nov. 10—Crude rubber used in the manufacture of tire casings, tubes and sundries in the third quarter of 1926 totaled 75,142 tons and sales value of shipments was $269,317,000, according to figures of the Rubber Association of America, Inc.

Corresponding figures for the second quarter of 1926 were 68,542 tons and $237,936,000, showing considerable gain in third quarter business. Figures for the third quarter of 1925 were 78,552 tons and $223,615,000.

Total crude rubber used for all purposes was 86,290 tons, against 80,140 in the second quarter and 91,534 in the third quarter a year ago.

Piston Ring Lowers Prices

BALTIMORE, Nov. 10—American Hammered Piston Ring Co. will make a general reduction in prices on Jan. 1, 1927, according to announcement this week. The reduction is made possible through increased production, and consequent reduced manufacturing cost, during 1926, the announcement said. Jobbers and dealers will be protected on goods in stock as of that date under the merchandising policy of the company.

Chevrolet Locates Major Parts Depots

Constant Supply of Quick-Moving Items Aim in New Distribution Move

DETROIT, Nov. 9—Chevrolet Motor Co. is establishing six more supply depots for the storage of quick-moving replacement parts in the United States, involving an expenditure of $1,500,000. They will be located at Oakland, Cal., Janesville, Wis., Cincinnati, Buffalo, St. Louis and Tarrytown, N. Y.

New buildings of steel, brick and concrete construction will house the depots except at Tarrytown and Oakland, where present buildings will be enlarged. The four new depots, it is expected, will be in operation by the end of January. Besides the six above named depots, the entire facilities of the central parts warehouse, at Flint, which until the present time has been the central shipping point, will be retained.

Expediting the delivery of parts and the creation of a reservoir to permit uniform factory parts production, regardless of seasonal variation, is the idea behind the plan. Stocks in carload lots will be sent to the major parts supply depots where they may be "mixed" according to zone requirements and reshipped with a minimum of delay and expense. Each supply depot will serve several parts warehouses in various Chevrolet zones.

Under the plan the zone parts warehouses, with stocks constantly replenished from the major supply depots, will always be ready to meet quickly the demand that might arise at service stations within the zone.

The depots will tend to smooth out the peaks and valleys of parts supply and demand, serving as safety valves between factories and the entire service organization. W. S. Knudsen, president, has assured J. P. Little, manager of the parts and service division, that an adequate parts supply will be assured at all times, regardless of the requirements of the assembly lines. The volume of this supply is based on yearly records of parts consumption which have been projected far into the future.

Parts used on models no longer in production which are only occasionally in demand will continue to be shipped direct from the Flint factory.

No Change in Car Taxes Under Proposed Program

WASHINGTON, Nov. 9—The automobile purchasing public, now paying a 3 per cent Federal excise tax on all new passenger cars and buses, will not be given any relief under the new tax program, discussed this week by Republican leaders with President Coolidge.

Ways and means of reducing the country's taxes are to be discussed here this week by the Joint Manufacturers' Special Committee on Federal Taxation, meeting at the United States Chamber of Commerce. H. H. Rice, chairman of the Taxation Committee, of the National Automobile Chamber of Commerce, will represent that organization, speaking for the automobile industry. The committee's discussion will primarily be devoted to reduction of corporation taxes.

Harvester to Use Hall-Scott Engines

DETROIT, Nov. 10—Arrangements have been completed whereby the American Car & Foundry Motors Co. will supply the International Harvester Co. with Hall-Scott engines for equipment in small trucks and buses. About 50 engines a week will be supplied at the outset from the Detroit plant of American Car & Foundry Motors.

The arrangements for the engine supply followed a conference in Detroit between W. H. Woodin, president of American Car & Foundry Co., parent of the motors company, and Alexander Legge, president of International Harvester Co.

Hall-Scott engines are now being used by American Car & Foundry Motors in its line of Fageol buses and in the new ACF buses which it is preparing for the market.

Brosseau Points Value of Business Paper Ads

NEW YORK, Nov. 10—A. J. Brosseau, president of Mack Trucks, Inc., was one of the principal speakers at the National Conference of Business Paper Editors here this week. His subject was "Marketing Service of the Business Press." In the course of his remarks Mr. Brosseau urged business papers, in appealing to advertisers, to stress the value of their concentrated and specialized circulation as contrasted with general publications.

Kaess Gets Air Mail Route

WASHINGTON, Nov. 10—The Kaess Aircraft Engineering Corp., of Amityville, N. Y., has been awarded the contract for air mail from Cleveland to Louisville. The concern will receive $2.20 a pound, and will be entitled to carry passengers and freight over the route, which covers 339 miles each way and which will serve Akron, Columbus, Dayton and Cincinnati between the termini. Twin motor ships of its own construction will be used by the company.

Ruling Favors Muir

LOCKPORT, N. Y., Nov. 10—Interference proceedings in the U. S. Patent Office between the McCord Radiator and Mfg. Co. and Wellington W. Muir, associated with the Harrison Radiator Corp., has been decided in favor of Mr. Muir. Steam cooling features were involved.

Business in Brief

Written exclusively for AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co., second largest bank in America.*

NEW YORK, Nov. 11—The outcome of elections exerted little apparent effect on the course of financial markets. While stock prices moved generally toward lower levels, the recession was not more pronounced than that of recent weeks. Commodity prices in general displayed the greatest strength observed for some time. Slight recessions in activity are reported by certain branches of the trade and industry, although operations in most lines continue on a high plane.

CROP CONDITIONS

The official cotton crop report based on condition Nov. 1 forecasts a yield of 17,918,000 bales, which is 464,000 bales larger than the previous estimate.

BUILDING CONTRACTS

Building contracts awarded last month in 37 states, according to the F. W. Dodge Corp., had a total value of $515,726,000. This is 8 per cent smaller than the September figure and 3 per cent below that of a year ago.

CAR LOADINGS

Car loadings during the week ended Oct. 23 numbered 1,209,043, virtually equaling the record total of 1,210,163 reported for the preceding week and far exceeding the total of 1,120,677 for the corresponding period last year.

BANK DEBITS

Bank debits to individual accounts reported to the Federal Reserve Board for the week ended Nov. 3 were 5.9 per cent below the total for the preceding week and 6.2 per cent below that of a year ago.

FISHER'S INDEX

Fisher's index of wholesale commodity prices stood at 153.5 last week, as against 150 a week earlier and 147.4 four weeks earlier.

FEDERAL RESERVE STATEMENT

Bills and securities held by the Federal Reserve banks increased $70,700,000 during the week ended Nov. 3, with gains of $44,000,000 in discounts, $24,600,000 in open market purchases and $2,200,000 in holdings of Government securities. Note circulation increased $24,900,000, while deposits decreased $4,700,000 and reserves $19,400,000. The reserve ratio declined from 73.6 to 72.8 per cent.

Loans of reporting member banks during the same period increased $56,000,000, loans secured by Government obligations rising $11,000,000, loans secured by stocks and bonds $38,000,000 and all other loans $7,000,000. Investments increased $11,000,000, borrowings from the Federal Reserve banks $46,000,000 and net demand deposits $103,000,000.

Price Changes Set on Some Tire Lines

Revisions to Take Form Mainly of Increased Discounts —Equipment Sales Low

AKRON, Nov. 8—A slight downward revision in automobile tire prices will be put into effect about Nov. 15, at the same time that solicitation of orders for spring dating is started among dealers, it is learned here from reliable sources. There probably will be no public announcement of a general tire price cut, as has been done in the past, the readjustment taking the form of extra discounts to dealers. Only a few lines and sizes will be affected, it is understood.

The raw material situation has not changed sufficiently to permit any drastic tire price reductions, but it is felt that the contemplated changes can be made without seriously affecting profits of the tire companies. Crude rubber is holding at about the same levels of last July, when the last price reduction on tires went into effect. On the other hand, cotton fabric, the next most important raw material in tire manufacture, has dropped seven to eight cents. Akron authorities do not look for any sustained rise within the next five or six months in either the rubber or cotton markets.

Recommendations of the Rubber Association of America provide for the return of a dating proposition almost identical with that offered in 1924, conditions varying in the four geographic zones into which the country has been divided. Shipments of tires will be made between Nov. 15 and Feb. 28 on easy terms, the dealer making final payments in April or May, when he has received cash for the merchandise from his customers. This proposition enables the manufacturers to maintain production at a fair rate during the usually dull winter months, preventing drastic curtailments or lay-offs of men.

Sees Sales Stimulated

During the last month tire dealers have not only been awaiting a decision on spring dating, but have been concerned over a possible change in the price situation. Clearing up of these problems probably will stimulate sales in the retail field, and in somewhat increased tire production. Operations of plants in the Akron district have slowed down in recent weeks, until tire production is now nearly 20 per cent below the peak of August and September.

Goodyear is turning out approximately 38,000 casings a day, compared with 45,000 a month or so ago. This company is taking advantage of the slack season to make changes in its vulcanizing equipment. Although no official announcement has yet been made, it is understood that the "All-Weather" diamond tread will be changed slightly, in order to improve the traction and wearing qualities of the casing.

Production has also declined between 15 and 20 per cent at the Goodrich, Firestone, Miller, General and other factories. The larger factories have curtailed more than some of the smaller concerns, owing to the seasonal slump in the automobile industry, with a consequent falling off in orders for original tire equipment. Shipments of tires from Akron to Detroit and other automobile manufacturing centers are 35 to 40 per cent less than what they were a month ago.

Aircraft Overhaul Good for 200 Hours

NEW YORK, Nov. 5—Aircraft maintenance and automobile maintenance were compared at the November meeting of the Automotive Service Association of New York. "Casey" Jones of Curtiss, Colonel Foulois of the Army and D. B. Collier of the Air Mail were the speakers.

Because of the vital necessity of reliability in aircraft, greater care must be exercised in its maintenance, but in other respects it does not differ materially from similar work on automobiles, it was stated. Colonel Foulois described the new maintenance system he has introduced at Mitchell Field, which is being adopted throughout the Army. Mr. Collier told about methods in the Air Mail Service while Mr. Jones described briefly how the commercial operator handles this work.

To show what great advances have been made in recent years, Mr. Jones mentioned that during the war 30 hrs. was about the maximum between engine overhauls, while now over 200 hrs. service is obtained. To illustrate further the great reliability of present planes, the record was quoted of the Dallas-Chicago mail route. Between May 12 and Oct. 1, 1926, there were only two forced landings due to mechanical trouble, although the mileage covered totaled 378,000. Such a record is largely attributable to careful maintenance. Mr. Jones also stated that he believed that the air-cooled engine would eventually become standard in commercial work.

Nash Ten Months' Total Shows Increase of 40,733

KENOSHA, Nov. 8—Nash sales and production set a new high record for October with a volume of 13,476 cars, E. H. McCarthy, general sales manager, reports. This was 43.9 per cent above the biggest previous October. For the ten months of this year Nash has marketed 125,441 cars as compared with 84,708 cars for the 1925 period. This makes a business increase so far this year of 46.3 per cent.

Ten months' sales have risen to a figure eclipsing by 29,320 cars the grand total achieved in the entire year of 1925.

Instalment Risks Fraction of Income

Finance Convention Report to Show Maximum Outstanding Comparatively Low

CHICAGO, Nov. 8—One of the reports to be read at the third annual convention of the National Association of Finance Companies will show that over $6,000,000,000 worth of merchandise is being sold annually in the United States on the instalment plan. Of the instalment debt of $4,500,000,000 created by instalment purchases after cash down-payments of 25 per cent, only $2,666,000,000 is outstanding at any one time.

The report will show that about 52 per cent of the outstanding debt on instalment goods at any given time is for motor vehicles, being a total of about $1,400,000,000.

It will be held in the report that the low ratio of the outstanding debt to the total turnover, about 43 per cent, is a safe and thoroughly sound banking condition. As against an annual income of $70,000,000,000 for the American public, it is pointed out that $2,666,000,000 is not an alarming mortgage.

The report indicates that at the beginning of 1925 there were about 1000 finance companies actively engaged in financing automotive instalment sales. Of these 350, including all of the largest companies, carry about one-third of the total automobile retail financing business. The rest is carried by smaller finance companies, dealers, manufacturers and banks. The majority of finance companies confine themselves to motor vehicles for the most part, it is shown.

S.A.E. Holds Brake Dinner

WASHINGTON, Nov. 9—Bureau of Standards experts and others interested joined with the Washington Section of the Society of Automotive Engineers in a "brake dinner" this week at which brake mechanisms of all kinds, and testing devices being used to develop more efficient brakes, were discussed. H. A. Allen, of the Bureau of Standards; Lt. Commander G. L. Smith and M. O. Eldridge, director of traffic in Washington, were among those who discussed brakes at the dinner.

To Hold All-Ceylon Show

WASHINGTON, Nov. 10—The All-Ceylon Motor and General Engineering Exhibition is to be held at Colombo from Jan. 6 to 16, 1927, a cable to the Automotive Division, Department of Commerce, states. The show is being organized by the Automobile Club of Ceylon and the Motor Traders' Association. Models of virtually every American, English and Continental motor car imported into the island are to be displayed.

Lighting Association to Push Code Action

Will Seek to Have Uniform Law Adopted in Many Coming Legislatures

CHICAGO, Nov. 6—At a meeting of the Automotive Lighting Association held at the Drake Hotel this week steps were taken to do further work in sponsoring uniform laws in the various states so that undue restrictions will not be placed on the manufacture, sale and use of lighting equipment.

A report of the legislative committee of the association indicates that good work already has been done. Cooperation with Committee A of Secretary Hoover's National Conference on Street and Highway Safety has resulted in the inclusion in the Uniform Vehicle Code of most of the lighting provisions advocated by the association.

The effort of the Automotive Lighting Association contemplates further work to promote the adoption of the Uniform Vehicle Code, for a majority of states will take up such legislation in the near future. The effect of good equipment in reducing accidents was pointed out in the case of the State of Texas where a law requiring a preregistration check of lighting equipment was followed by a reduction in night accidents ranging from 50 per cent to as much as 80 per cent in some of the more populous communities.

A report was also presented by the standardization committee which is working to reduce the number of sizes and to establish some uniformity in lamp construction.

One of the details now apparently established is the continued use of red glass for the tail light. Some agitation has indicated a demand for the use of yellow, but red remained standard in the Uniform Vehicle Code.

Officers for the ensuing year were elected as follows: H. J. Monson, Guide Motor Lamp Co. of Cleveland, president; J. H. Cattell, Warner Patterson Co., Chicago, vice-president, and C. Sklarek of the Lorraine Corp., Chicago, becomes secretary and treasurer.

Illinois Highway Program to Add 1000 Miles in 1927

QUINCY, ILL., Nov. 6—Twenty-five thousand people gathered here at the celebration of the tentative completion of the final miles of the paved highway under the $60,000,000 bond issue—Illinois' first step toward a state-wide highway system, which was later augmented by a $100,000,000 bond issue.

Gov. Len Small, who has sponsored the paved highway system, speaking at the celebration last week, said that 1000 miles of paved roads would be added next year and Frank T. Sheets, superintendent of highways, told the history of the commission's activities and outlined its program.

REFINING CHANGES TO DOUBLE MILEAGE

CLEVELAND, Nov. 4—The world is on the verge of a complete revision of methods of refining petroleum that will double the mileage of automobiles, C. F. Kettering, president of General Motors Research Corp. told the Branch Managers' Club of the Cleveland Trust Co. at the University Club here last night.

Mr. Kettering said the final solution of aviation would be the powering of planes by radio. He described the development of Duco painting for automobiles and said it made possible the turning out of 1200 Buicks a day.

He concluded by saying the industry would be sound so long as manufacturers continued production on the curve of demand and so long as people wanted the things they didn't know they needed until they were convinced of the fact.

Highway Research Program Outlined

WASHINGTON, Nov. 10.—The program for the annual meeting of the Highway Research Board, to be held at the National Research Council Building in Washington, Dec. 2 and 3, has been completed, according to announcement made by the board.

A. N. Johnson will preside at the opening session at 10 a. m. Thursday, Dec. 2, at which addresses will be made by Vernon Kellogg, of the National Research Council; George K. Burgess, of the U. S. Bureau of Standards, and C. M. Upham, director of the Highway Research Board. H. C. Dickinson, of the Research Board, will report on the causes and prevention of highway accidents. Economic construction of highways will be the principal topic for the afternoon session, and the annual dinner will be held at the Hotel Washington at 7 p. m. Thursday night.

T. H. MacDonald, of the U. S. Bureau of Public Roads, will preside at Friday morning's session, which is to be devoted to discussion of highway traffic analyses and highway financing, with particular attention to the financing of maintenance work. A. J. Brosseau, of Mack Trucks, Inc., will preside at Friday afternoon's session, at which improved road investigation will be the principal topic.

Stearns Sales Increase

CLEVELAND, Nov. 9—Sales of Stearns-Knight cars in October exceeded totals for September by 55 per cent, according to a statement by the factory. Dealer commitments indicate that a still greater increase will be recorded in November.

G.M. Export Locates Plants in Far East

Will Assemble Chevrolets in Japan and Singapore—Other Cars May Follow

NEW YORK, Nov. 8—General Motors Export Co. will have assembly plants in operation at Singapore and Kobe by April, 1927. Chevrolets will be turned out at first and possibly other General Motors lines later on. These will be the first assembling plants of the company to be established in the Far East.

Operating managers are already on the way to the two points. For the work at Singapore the following have been assigned: V. A. Davison, managing director, General Motors Asia, Ltd.; W. B. Wachtler, assistant managing director; J. R. Austin, sales manager; J. L. Godden, assistant sales manager; E. C. Richard, production manager; S. E. Dithmer, assistant production manager; W. van H. Ezerman, treasurer; R. W. Poe, service manager; E. C. H. Shillaker, supply manager; John E. Weik, advertising manager; F. E. Nestor, parts manager, and W. L. Malone, in charge of analysis.

The following have sailed for Kobe: H. B. Phillips, managing director, General Motors Japan, Ltd.; K. K. Hoagg, assistant managing director; H. Diment, treasurer; J. H. Berry, production manager; T. G. Eybye, sales manager; S. C. Palmer, assistant sales manager; J. J. Welker, service manager; J. M. Brown, supply manager; C. R. Keeler, parts manager, and George Douglas, advertising manager.

Spanish-German Air Line Planned to South America

MADRID, Oct. 28. (*by mail*)—Beginning Oct. 20 a series of conferences were held here between delegates, both diplomatic and technical, from various countries in Central and South America and the Spanish government. The purpose of the meetings was to provide regulations facilitating a trans-Atlantic air service between Seville and the South American continent. Plans call for a route from Seville to Buenos Aires with an extension to Berlin starting in 1927.

The presence of delegates from the Junkers company and the fact that this company is at present engaged in building airplanes for long range service, with passenger capacities ranging from 25 to 100, were taken to indicate that a strong bid for this service is being made by German interests. It is probable that the line will be under control of the Spanish government operating German planes. Plans are being made also to establish a vast aircraft industry in Spain under the direction of German engineers which would include dirigible construction.

Men of the Industry and What They Are Doing

P. S. Fay Named by White to Head Northern Region

At a series of meetings held in Boston, Vice-President and General Manager Thomas H. White, of the White Co., Cleveland, announced changes in the New England district which were in the nature of promotions. Perry S. Fay, who has been Boston district manager for about a year, has been made vice-president of the company's Northern Region.

Frank E. Triebner, formerly national sales manager for the White company has been appointed district manager at Pittsburgh. Mr. Triebner has been with White since January, 1919, when he joined the general sales department. In 1920 he became a division manager in charge of public utilities. In July, 1923, he was named national sales manager.

F. P. Steinhauer, Chicago salesman has been appointed territorial manager of the Chicago district under District Manager H. E. Seanor. He will have charge of territory outside of Chicago embracing what was formerly the Lake Michigan District and succeeds E. A. Manning, resigned.

Fred H. Chestnut, former assistant to Vice-President G. A. Urquhart of the Pacific Coast region has been placed in charge of all the company's bus business on the Coast.

Val Haresnape Resigns

Val Haresnape has tendered his resignation as secretary of the Contest Board of the American Automobile Association, effective Dec. 31, 1926. Mr. Haresnape became secretary of the Contest Board early this year and since that time considerable progress has been made in reorganizing it and establishing better conditions governing sanctioned automobile racing in the United States. Ernest N. Smith, general manager of the A. A. A., states that consideration is being given to obtaining a successor to Mr. Haresnape as soon as possible.

N. A. C. C. Names Committee

P. L. Emerson of Yellow Truck & Coach Mfg. Co., and L. L. Woodward of the Autocar Co., were added to the motor truck committee of the National Automobile Chamber of Commerce when the directors of the N.A.C.C. met this week. Mr. Emerson also was appointed to the street traffic committee. George A. Green was appointed to the truck standards committee.

Takes Robert Bosch Post

J. H. Mayforth has joined the trade sales department of the Robert Bosch Magneto Co., Inc., New York. He was previously with the Eisemann Magneto Corp., serving 14 years as superintendent of maintenance and for the past three years in the eastern sales department.

JUDSON HAS OFFICE IN COMPANY PLANE

Continental Motors Corp. has fitted out its three-engined Fokker airplane as an office for its president, Ross W. Judson, and other executives on their frequent trips between the Detroit and Muskegon factories.

A dictaphone and other office equipment have been installed, the dictaphone making it unnecessary to carry a stenographer. Letters dictated are transcribed at either end in time for Mr. Judson or the other executives to sign before leaving for the return trip.

The plane accommodates eight persons and is so insulated that conversations may be carried on without disturbance by the engine noises.

Peter Named Export Head

C. M. Peter has been appointed export director of the Black & Decker Mfg. Co., following his return from England where he supervised the formation of Black & Decker, Ltd., now in operation in London. Col. W. V. Franklin has been appointed manager of the London company, returning to England after a three months' stay at the factory where he studied the company's products and its merchandising methods.

O. C. Kanitz, who has been appointed representative in Continental Europe for Black & Decker, Ltd., is now at the Towson plant where he will remain three months.

Lie Joins Chrysler

Christian Lie, who for several years was prominent as Buick distributor for France, has become connected with the Chrysler Corp., at Antwerp, Belgium, and will act as assistant to S. D. Briggs, European manager. G. Loiseau, Buick agent for Paris and district, who took over the organization built up by Mr. Lie, will in future handle Cadillac as well as Buick sales in this territory.

Raudales Joins Robins

E. T. Raudales has been appointed representative of the H. M. Robins Co., Detroit, exporter, in Mexico and Central America, with headquarters in Mexico City. After serving for a number of years as Consul-General of Guatemala in Chicago, he recently resigned to enter the commercial field with the Robins company.

Standard Names Sasscer

J. W. Sasscer has been appointed director of purchases of the Standard Motor Truck Co., Detroit, succeeding O. M. Hanson, according to announcement by Albert Fisher, president.

General Motors Export Makes Personnel Changes

J. D. Mooney, president of General Motors Export Co., returned to New York this week for a brief stay. A. S. Murray, treasurer of the company, is on ship bound for South Africa where he will spend the next four or five months. R. Staudinger, assistant treasurer, has returned to New York to take Mr. Murray's place during his absence.

Albert deTonnay, formerly managing director of General Motors of Brazil, has been transferred to Buenos Aires, where he becomes managing director of General Motors, Argentina, succeeding T. M. McConnell. G. W. Lewis has been made assistant managing director at Buenos Aires. A. F. Bassett, formerly with Hyatt Roller Bearing Co., has been made managing director of General Motors of Brazil.

R. G. Lewis has been moved to Detroit where he will be technical sales advisor to the general sales manager. R. W. McLaren has assumed the position of treasurer of General Motors G. m. b. H., at Hamburg, Germany, succeeding T. H. Mengel.

Cobleigh and Loomis Delegates

Harry R. Cobleigh, secretary of service, and Edward F. Loomis, secretary of the motor truck committee, of the National Automobile Chamber of Commerce are delegates from that body to the transportation and service meeting of the Society of Automotive Engineers in Boston. Following the Boston meeting, Mr. Cobleigh will attend the show and convention of the National Standand Parts Association which will be held in Chicago.

Named Coast Representatives

I. F. Packard and F. F. Davis have been appointed Pacific Coast representatives of Keasbey & Mattison Co., manufacturer of magnesia and asbestos products. Mr. Packard has been in charge of the automotive division of the company for the past four years and Mr. Davis has been in charge of the statistical and auditing department for seven years.

Kruse Joins K. C. Fabric

H. M. Kruse, formerly general sales manager of Clifton Mfg. Co., Waco, Texas, has joined the Kansas City Fabric Products Co. as secretary. The Kansas City company took over the automotive fabric division of the Baker-Lockwood Mfg. Co., Inc., early this year.

Bohn Names Vice-Presidents

C. W. Eggenweiller, W. T. Bohn and H. W. Holt, plant managers of Bohn Aluminum & Brass Corp., have been appointed vice-presidents of the company.

Executives Attend Funeral of Bassett

Buick Executives Serve as Bearers at Service for Late President

FLINT, Nov. 9—Friends and business associates of Harry H. Bassett, president and general manager of Buick Motor Co. and vice-president of General Motors Corp., gathered here Sunday afternoon at the private funeral service held from his late residence. Dr. John Dysart, rector of St. Paul's Episcopal Church, read the service and spoke briefly.

Fellow executives in Buick Motor Co. carried the flower-laden bronze casket from the residence. At the mausoleum in Glenwood Cemetery, members of the executive committee of General Motors Corp. and Flint friends of Mr. Bassett, who were honorary pallbearers, formed an aisle through which the funeral party passed.

Outside of General Motors the industry was represented by Walter P. Chrysler, president of Chrysler Corp.; Charles W. Nash, president of Nash Motors Co. and DuBois Young, president of Hupp Motor Car Corp. Many leading Buick distributors attended the services.

Litle Sees Future Car Following Racing Design

PHILADELPHIA, Nov. 10—At the meeting of the Pennsylvania Section of the Society of Automotive Engineers last night, T. J. Litle, Jr., president of the society, presented a paper on the future trends in car design. Mr. Litle said that smaller cars with high-speed engines, excellent riding qualities, and luxurious equipment will be popular in the future. Performance will be the major selling argument although no car which does not look and ride well will be able to hold a market.

Present racing car design will have a considerable influence on future production designs to secure better operating characteristics with a minimum of weight, Mr. Litle said.

Prior to the presentation of Mr. Litle's paper a nominating committee for the section officers for 1927-8 was elected and a resolution was passed expressing the opinion of the section that, if possible to secure proper accommodations, the annual summer meeting of the society should be held in the East.

GM to Move May 1

NEW YORK, Nov. 8—Executive office and other departments of General Motors Corp. will be moved into the new General Motors Building at Broadway and 57th Street on May 1, according to present plans. The new structure is rapidly approaching completion. The brick work is now going up at the rate of a story a day.

**To the Memory of*
HARRY H. BASSETT
A TRIBUTE

In the passing of HARRY H. BASSETT, *the automobile industry has lost one of its ablest leaders.*

Working up through the ranks of business to the head of one of the leading companies in the industry, his life has been an inspiration to all in the business, from the lowliest to those in the highest executive places.

His vision included the larger aspects of the industry as well as its immediate problems.

His participation in the building of the General Motors Institute of Technology was typical of his concern in the scientific problems of the industry.

His leadership of the Industrial Mutual Association of Flint indicated his understanding of the problems and interests of the workers.

His activity in the cooperative efforts of the National Automobile Chamber of Commerce was an example of his many contributions to the progress of the industry as a whole.

His character as a husband and as a father was an inspiration to all that knew him.

The Directors of the National Automobile Chamber of Commerce render deep tribute to his high character and to his ability in the automobile industry, and extend their heartfelt sympathy to his family and associates.

*Resolution by National Automobile Chamber of Commerce.

European Companies Increase Sales Effort

NEW YORK, Nov. 8—The automobile business abroad is increasing rapidly but American manufacturers are now beginning to feel the force of competition from European manufacturers, James D. Mooney, president of General Motors Export Co., declared today on his arrival from Europe on the Leviathan. European manufacturers are making much progress, as was demonstrated at the recent Olympic show, he said. Their competition is becoming an important factor in our export business. Harry Tipper, general sales manager, returned on the Leviathan with Mr. Mooney.

Mr. Mooney said General Motors foreign sales would aggregate $100,000,000 in value in 1926 and that this would be increased to $125,000,000 in 1927. The company now has 4000 dealers abroad and this number is constantly increasing. Mr. Mooney declared the Scandinavian countries offered the best present European market.

Pierce-Arrow Outlook Good

NEW YORK, Nov. 9—"The outlook for Pierce-Arrow Motor Car Co. is very bright for next year," said Myron E. Forbes, president, on his arrival on the Leviathan. "October shipments were up to schedule and November is running very satisfactorily."

American Express Signs Air Contract

Will Use Planes on Routes as Available for All Suitable Size Packages

NEW YORK, Nov. 11—R. E. M. Cowie, president of the American Railway Express, announced this week that his company had closed a contract with National Air Transport, Inc., to carry company packages by airplane over two routes which are to be the first of a proposed national network of air lines.

The first route will be between New York and Chicago and the second between Chicago and Dallas, Texas, with service to intermediate points on both lines. Augmenting the present railway express system, the air service is expected to be in full operation not later than April 15 next.

"The demand of American commerce for the quickest possible transportation service at all times is responsible for the innovation," Mr. Cowie said.

By air service the company expects to save at least one full business day in the delivery of express matter of the size and weight suitable for air transportation between New York and Chicago and the latter city and Dallas. The planes will fly both night and day with economy of time as the major objective.

The express company will function in the local pick-up and delivery of express packages and the plane transport organization will do the carrying.

Uses Prize Winning Plane

KANSAS CITY, Nov. 10—National Air Transport, Inc., is putting the Wright-Bellanca cabin monoplane into regular air-mail service between Dallas and Chicago according to an announcement made here by E. P. Lett, operations manager. This plane which is powered with a 200 hp. Wright "Whirlwind" engine is the ship which won the Speed and Efficiency Race for commercial planes at the national air meet in Philadelphia in September. This ship with its high speed of 130 m.p.h. compares favorably with any plane of its power and load capacity in commercial service in this country.

Tests are now being carried out by National Air Transport on the Wright-Bellanca with a view to determining the practical value of this type of plane for bad weather travel and for night flying.

A new Ford-Stout passenger monoplane has also been delivered to National Air Transport. This plane made its first official trip between Kansas City and Chicago, Nov. 9. It will be placed in regular passenger service between Kansas City and St. Louis immediately following its preliminary trips over the Chicago-Dallas mail route.

GMC Assets Show $211,106,601 Gain

With Fisher Company Cash is Increased $24,081,491 and Inventories $35,316,298

DETROIT, Nov. 8.—General Motors Corp. net earnings, including equities in subsidiary companies, for the first nine months this year total $149,317,553, as compared with $80,921,018 for the same period in 1925. Deducting $5,733,325 for dividends on the senior securities, there remains $143,584,228 applicable to the common stock, equivalent to $17.77 a share, compared with $9.71 per share for the corresponding period of 1925. The earnings statement and balance sheet are the first submitted since the Fisher Body Corp. consolidation.

Net earnings of the corporation for the third quarter, including the corporation's equity in subsidiary companies, were $56,031,879, compared with $30,557,919 for the corresponding period of 1925. Earnings for the third quarter exceeded those of any previous third quarter.

The balance sheet as of Sept. 30, 1926, shows that cash and marketable securities were $169,223,579, an increase of $24,081,491 since Dec. 31, 1925. Inventories increased $35,316,298. Increase in total assets was $211,106,601, of which $85,217,209 was in current assets and $125,889,392 in fixed assets.

Surplus shows a decrease from $119,020,473 to $102,149,375. Total capital stock and surplus is increased from $488,978,241 to $649,461,056. The total of all assets is shown as $914,893,266.

Form Dayton Flying Club to Boost Civil Aviation

DAYTON, Nov. 8—Formation of the Dayton Flying Club was effected by a group of civilians and airplane manufacturers of Dayton at a meeting in the Engineers Club last night. The organization will devote its activities to practical flying and the promotion of civil and commercial aviation in Dayton.

An auspicious and practical start was given to the club when E. A. Johnson, president of the Johnson Airplane & Supply Co., made an outright gift to the organization of a complete JN 4 two-seater airplane, powered with a Curtiss OX 5 motor. In addition Mr. Johnson tendered members of the club the use of Johnson field and hangars on the Wilmington pike for storage and maintenance of the plane and for offices and club rooms of the organization. The club is to be incorporated under the laws of Ohio.

Canada Tire Exports $12,942,721

WASHINGTON, Nov. 10—Canadian factories exported 817,791 casings, valued at $11,016,025, and 789,499 inner tubes, worth $1,926,696, during the first nine months of the present year, a report to the Department of Commerce from U. S. Trade Commissioner Meekins at Ottawa states. Australia received most of the exports, with the United Kingdom, Dutch East Indies, Denmark, France and the Netherlands following in order.

The September exports from Canada totaled 92,575 casings, with a value of $1,150,080 while inner tube exports during the month numbered 71,354, valued at $165,332.

Peerless Surplus Shows Million Gain

CLEVELAND, Nov. 8—Peerless Motor Car Co., in its statement as of Sept. 30, 1926, shows current assets to current liabilities in ratio of better than six to one. The company had $6,054,397 working capital Sept. 30. Net profits for nine months totaled $1,139,330 against $258,457 in corresponding period last year while surplus totaled $3,418,906 compared with $2,410,588, Dec. 31, 1925. The comparative balance sheet follows:

Assets	Dec. 31 1925	Sept.30 1926
Cash, Securities, etc...	$578,372	$2,833,646
Receivables	706,183	458,755
Inventories	3,584,175	3,909,383
Sundry securities.....	.....	1,212
Plant equipment.....	4,885,100	4,366,861
Patents, good will.....	1	1
Other assets.....	75,582	46,632
Deferred charges.....	30,088	56,369
Total	$9,859,501	$11,672,859
Liabilities		
Accounts payable.....	$880,179	$996,228
Notes payable.....	1,507	.....
Taxes payable.....	52,248	33,491
Accrued taxes.....	119,127	117,668
Customers deposits....	68,292	.....
Reserves	.....	179,006
Capital Stock.....	6,327,560	6,927,560
Surplus	2,410,588	3,418,906
Total	$9,859,501	$11,672,859

Executives Lend Support to Vane Florida Action

ST. LOUIS, Nov. 5—Letters congratulating him on his stand against diversion of Florida gasoline tax for State advertising purposes have been received by C. A. Vane, general manager of the National Automobile Dealers Association from a number of executives in the automotive industry.

C. D. Hastings, chairman of the board of directors of Hupp Motor Car Corp., said "you hit the nail on the head."

D. S. Eddins, general sales manager of Olds Motor Works, endorsing Mr. Vane's stand, wrote to the Olds branch in Atlanta, suggesting that the situation be pointed out to Olds dealers in Florida so that they would know how to act if the matter became agitated.

Wills Concentrates on "6"

DETROIT, Nov. 8—All of Wills Ste. Claire, Inc., production is now concentrated on its six-cylinder Model T. Manufacture of its former standard eight-cylinder line is now on special order only. The six-cylinder Model W is being produced in limited quantity.

Goodyear Suit Rests on Decree in 1923

Court to Determine Whether Former Action Was Settled or Adjudicated

AKRON, Nov. 9—Both sides are marking time in the legal fight which may determine future control of the Goodyear Tire & Rubber Co., pending a decision by Common Pleas Judge S. D. Kenfield on the motion of Frank C. Tomlinson, a stockholder, to change journal entries in the Weiss suits.

If the decrees of the late Judge W. J. Ahern, marking the end of these cases early in 1923, are allowed to be altered and made to show that an "agreed settlement" took place, instead of an adjudication of the issues at stake, as claimed by attorneys for minority stockholders, the way will be paved for new litigation attacking the Goodyear management and its 1921 refinancing plan along lines somewhat similar to those covered in the Weiss suits. The plaintiffs allege the former litigation ended in a "settlement," to which Tomlinson and other stockholders did not agree.

Referring to what he termed an unwarranted attack on Goodyear, Mr. Baker said the great financial structure now under fire "picked up a shipwrecked company and made it a great cargo-carrying company of the high seas." He cited the "injustice" that would be done the 75,000 or more Goodyear stockholders if this decree were altered. "People all over the world have been investing in the shares of this company for the past three years in the belief that the litigation over its affairs was ended," he declared.

Two other suits attacking the Goodyear management are pending in Supreme Court.

Toledo Employment Lower

TOLEDO, Nov. 8—Toledo automotive plants have shown a decrease of about 20 per cent in employment as compared with the same period last year. However, the Chevrolet Ohio Motor Co. has been keeping up to its high level of production and has even added a few employees in recent weeks. Most of the other large plants are gradually narrowing down employment to moderate production schedule.

Opens Warehouse on Coast

ST. LOUIS, Nov. 8—McQuay-Norris Mfg. Co. has opened a warehouse in Oakland, Cal., which will act a booster stock to back up jobbing distribution on the Pacific Coast. The warehouse will be tooled to give size service.

Form Body Sales Company

NEW YORK, Nov. 8—A corporation is being formed here by LeRoy Moody and W. deRahm to handle sales of custom built bodies for Stutz chassis.

Higher Fuel Prices Raise Steel Costs

Disinclination to Accept First Quarter Business Shown in Some Quarters

NEW YORK, Nov. 11—Steel producers incline to the belief that the low point in automotive demand has been reached, and that December will develop gradually rising buying interest that should culminate in a fair-sized buying movement before the end of the year. What few requests steel mills have received from automotive consumers to defer shipments of specified material were prompted solely by a desire to overcome the arrival of fresh material during the period of stock-taking, and, so soon as inventories have been completed, this material will be ordered shipped.

Whether they wanted to or not, automotive foundries have been compelled in the last few days to give some attention to the pig iron market where, under the influence of abnormally high coal and coke prices, moderate advances have taken place, but these alone would hardly have perturbed consumers. Not only are much higher asking prices talked of, but some blast furnace interests appear to be fully convinced that the turn in the situation has come at last, and are unwilling to tie themselves up for representative tonnages for first quarter 1927 shipment, preferring to take their chances on the price bulge they look for to materialize.

So far, melters show stiff resistance to absorbing even the $1 advance that blast furnace owners contend represents the actual additional cost to them for fuel. The steel market remains entirely unaffected by the pig iron situation. Steel bars are easy at 2 cents, Pittsburgh, and sheet bars, while pegged at $36, are in more abundant supply than at any time this year. Competition for what cold-rolled strip steel orders are in the market has grown so keen that buyers of round lots are virtually in a position to dictate price.

Pig Iron—Asking prices are on a $20, valley, basis for No. 2 foundry, but no business has been done at that figure which represents an advance of $1.50 over recent levels. Detroit furnaces quote $20.50, as against $20 during the second half of October. Some eastern furnace interests have gone so far as to say a $25 market would not surprise them. Cast iron scrap, suitable for foundry use, has hardened under the influence of the virgin metal market.

Aluminum—Arrivals of German aluminum have been relatively heavy lately; all of this metal, however, is believed to be earmarked against contracts. Norwegian and British shipments are rather light. Reductions of 1 @ 1½c per pound are reported to have been made by the domestic producer in prices for aluminum alloys. Copper enters to the extent of 8 per cent and upward into No. 12 alloy, but low copper prices are hardly as much at the bottom of this reduction as competition by secondary refiners. The virgin aluminum market remains unchanged.

Copper—Domestic demand is light, and the market is easy. Prices for automotive brasses remain unchanged.

Tin—Scarcity of spot metal has been relieved to some extent by fair-sized arrivals this week. The world's visible supply showed a slight increase on Nov. 1.

Lead—Lower prices have stimulated buying. Storage battery interests are in the market.

Zinc—Consumers' stocks are believed to be very light, presaging more active buying in the near future.

Rim Output Falls Below 1925 Totals

CLEVELAND, Nov. 9—Rim production dropped from 2,550,431 for October, 1925, to 1,828,539 for October of this year, according to the report of the Tire & Rim Association of America. During the first 10 months of 1925 there were 22,192,465 rims produced and during the same period this year, 21,882,712.

October production totals in principal sizes were as follows:

	October 1926	October 1925
Clincher		
30x3½	162,288	464,764
Balloon		
28x3½	814,313	1,074,446
28x4	208,907	264,371
29x4	154,983	147,155
30x4½	112,622	169,440
30x5	12,693	45,871
31x5	23,787	28,679
High Press.		
30x3½	29,325	26,566
32x4	15,305	29,767
32x4½	37,430	54,262
Truck "20"		
30x5	119,312	51,342
Truck "24"		
34x5	4,291	6,519
36x6	4,401	9,293

Laidlaw New President of Fabric Manufacturers

CHICAGO, Nov. 7—W. R. Laidlaw was elected president of the Associated Manufacturers of Fabric and Auto Equipment at the annual meeting held here this week. Other officers elected were Joseph Osteen, vice-president; R. M. Thomas, treasurer, and Howard Zink, secretary.

Addresses at the meeting were by Clyde Hinson, former president; W. J. Platke and R. R. Cunningham.

Meetings of the association in the future will be held semi-annually instead of quarterly.

Chrysler Adds Export Car

DETROIT, Nov. 8—Chrysler Corp. has added a special seven-passenger phaeton on the Imperial 80 chassis, listing at $2695, which is designed exclusively for the export market. The new car embodies the characteristics of the domestic five-passenger phaeton, but is provided with a skeleton top which can be folded into a minimum of space.

Titeflex Hose Moves

NEWARK, Nov. 8—Titeflex Metal Hose Co. is now located in its new quarters at 500 Frelinghuysen Ave., where it has added considerably to its manufacturing space and is preparing to extend the distribution of its product.

Truck Regulation Not Public Need

Utility Commissioners Told Shippers Can Protect Selves by Private Vehicles

ASHEVILLE, N. C., Nov. 11—Red tape and officialdom were termed the menaces of the motor truck business of today by C. C. McChord, counsel for the National Automobile Chamber of Commerce, addressing the National Association of Railway and Public Utilities Commissioners at its meeting here today.

All regulation is costly to the government and the public, he said, and can be defended only when major public interests are threatened. Were public truck carriers to charge exorbitant rates, private shippers could protect themselves without recourse to regulatory bodies by operation of their own vehicles, Mr. McChord said. Problems of size and weight of trucks could be covered as they are today under State motor vehicle acts.

He said further:

"Measured in terms of possible maximum ton mileage capacity, the motor trucks of the United States can handle just 1.9 per cent of the possible volume which the rail lines can carry. Supplement this by the now well-known fact that practically all economic motor truck operation is within a radius of approximately 30 miles, and it becomes apparent that the chief function of the motor truck is not in competition with the railroads in like services.

"From 79 per cent to 91.3 per cent of the total movement is a privately operated service maintained by corporations and individuals as an integral part of their business of distribution of commodities.

"The truck movement is essentially a local step in the distribution of commodities which not alone frees the rail lines from the type of business to which the rail is not adapted, but actually widens the zone of influence of the rail and provides it with a new and constantly growing and profitable long distance tonnage.

Chandler Sales Increase 124% in Twelve Cities

CLEVELAND, Nov. 9—Chandler's sales gain in 12 large cities for the three months ended Oct. 30, was 124 per cent, according to Sid Black, vice-president. The increases by cities are given as follows: Cincinnati, 250 per cent; Los Angeles, 227; San Francisco, 184; Cleveland, 157; Baltimore, 155; New York, 130; Birmingham, 91; Pittsburgh, 73; Indianapolis, 65; Buffalo, 54; Rochester, 45; Milwaukee, 45. A gain of 15 per cent during October over the same month of 1925 is also reported by Mr. Black.

Willys Net Decline Laid to Price Drop

TOLEDO, Nov. 11—Statement of Willys-Overland Co. and subsidiaries for quarter ended Sept. 30, 1926, shows profit of $2,229,329 after ordinary taxes, depreciation, interest, etc., but before Federal taxes, comparing with $7,348,126 in preceding quarter and $3,183,299 in third quarter of 1925. Profit for first nine months of 1926 totaled $10,811,280 before Federal taxes, comparing with $13,638,881 in same period of the previous year.

After allowing for estimated Federal taxes on a basis of 13½ per cent, indicated net profit for the September quarter was $1,928,369, equivalent after 7 per cent preferred dividend requirements, to 63 cents a share earned on 2,527,051 shares of common stock. This compares with $6,356,128, or $2.39 a share, on common in preceding quarter, and $2,769,470, or $1.05 a share, on 2,264,644 shares in the third quarter of 1925.

Indicated net profit after allowing for Federal taxes for nine months of this year was $9,351,757, equal to $3.32 a share on the common, comparing with $11,865,826, or $4.72 a share, in same period of 1925.

Referring to the report, John N. Willys, president, said:

"The decline in net during the third quarter is attributable to price reductions of September involving smaller profit per car and the usual dealer rebate. The volume of business during the fall months has been encouraging."

Timken Bearings Ordered for 12 St. Paul Trains

CANTON, Nov. 10—The order received by Timken Roller Bearing Co. from the Chicago, Milwaukee & St. Paul Railroad is for bearing equipment for 127 railroad cars. These cars will be used on the two crack trains of the railroad, the Pioneer Limited, between Chicago and Minneapolis, and the Olympian, between Chicago and Tacoma and Seattle.

In addition to increased riding comfort for passengers, due to smoothing out jerking in starting and stopping, the bearing equipment is designed to make for increased economy in operation through lessening of power requirement.

Rickenbacker Names Officers and Board

DETROIT, Nov. 10—Stockholders of Rickenbacker Motor Co. at the adjourned annual meeting re-elected B. F. Everitt, president, and named C. M. Tichener, vice-president and general manager, and E. R. Evans, secretary and treasurer. Directors elected including the officers were W. H. Stevens, Boston; Lafayette Markle, Chicago; B. L. Cumber, New York; R. M. Hood, J. K. Nichols and W. A. Macks.

At the directors' meeting Mr. Tichener was appointed general manager. Details of a plan to be worked out by him were to be explained to directors late this week for their approval and for recommendation to the receivers. It is understood the company will proceed with manufacture of new models shown at the directors' meeting.

Mack Net $1,558,793

NEW YORK, Nov. 10—Mack Trucks, Inc., reports net profits of $1,558,793 for the quarter ended Sept. 30 after charges and Federal taxes. This compares with $2,614,205 in the third quarter of 1925. For the nine months net profit totaled $7,289,494 after all charges as against $7,268,053 in the same period in 1925.

Willys Adds Town Car

TOLEDO, Nov. 11—Willys-Overland Co. has added a town car listing at $3950 on the Willys-Knight 66 chassis. The car has full curve roof and is finished in gray with black molding relieved with ivory striping.

Financial Notes

Mason Tire & Rubber Co.'s report shows a surplus of $10,462 has been substituted for the deficit which has appeared since 1923. After all charges and depreciation and an additional special reserve of $85,000, the company carried $309,178 to surplus in the nine months ended Sept. 30. This compares with $126,929 in the same period of 1925. Balance sheet shows the company to have $2,114,396 working capital, an increase of about $500,000 for the nine months.

Rolls-Royce of America, Inc., declared a dividend of $1.75 on its preferred stock, payable Nov. 15 to stock of record Oct. 30. This is the first payment in five years. Action on back dividends amounting to $35 is withheld until after results of 1926 operations have been disclosed. Profits in 1925 were $519,169. The previous deficit of $238,354 is reported wiped out.

Chandler-Cleveland Motors Corp. reports net profit of $381,512 after depreciation, Federal taxes and other charges, for the September quarter. This is equal after preferred stock requirements to 11 cents a share earned on the 280,000 outstanding shares of no par value common stock.

Mullins Body Corp. shows net income of $235,200 after all charges but before Federal taxes for the nine months to Sept. 30. This compares with $273,063 in the same period of 1925. For the September quarter, profit was $85,472 as against $42,711 in the same quarter of 1925.

Moto Meter Co., Inc., shows net income of $370,434 for the quarter ended Sept. 30, after all charges, as compared with $509,268 in the third quarter last year. For the nine months to Sept. 30, net income totaled $1,465,287 as against $1,496,791 in the same period last year.

Pratt & Lambert, Inc., has declared the regular quarterly dividend of 75 cents a share and an extra dividend of $1 a share on the no par common stock, payable Jan. 3 to stock of record Dec. 15.

Apco Mfg. Co. reports net sales for the first six months ended June 30 of $647,171. Net profit after interest, depreciation and reserve for Federal taxes, was $45,702.

Developments of the Week in Leading Motor Stocks

NEW YORK, Nov. 10—Motor stocks in general have been maintaining previously established quotations, though declines in two or three of the accessory and equipment shares brought them down approximately to the lows of the year. Market attention has been diverted from the automotive group, and an absence of speculative operations continues to characterize the situation.

Recent reports in Wall Street of curtailed operations at the factories apparently have been disregarded, which may be a sign that the belief is now held that the recent declines have sufficiently discounted the effects of the quieter period the industry is now going through. It certainly appears that the stocks are now in stronger hands, and if, as is frequently declared, the speculative movement was carried too high in the early fall, the condition has been thoroughly corrected.

The only stock in the group to receive much attention during the week was General Motors, which alternately advanced and declined in sympathy with changes in market sentiment with regard to the impending dividend meeting. President Sloan's statement on his return from Europe apparently was met with conflicting interpretation with a tendency to adopt the bearish viewpoint, despite his declaration that the corporation was in good condition financially to declare a substantial extra-dividend.

Gabriel Snubber, Stewart-Warner, Stromberg Carburetor and some other equipment stocks declined without adequate explanation other than the recessions in automotive production. In the absence of evidence that the current curtailment has any long-range significance it would appear that the selling in this group has been considerably overdone.

Some of the motor shares, on the other hand, displayed moderate strength, Hudson rallying several points from the year's low. Peerless, lately admitted to trading on the Exchange, gained two or three points, but other car manufacturers showed only fractional gains or losses. Tire stocks were likewise inactive.

Packard Distributes Bonus to Employees

Workers Five Years or More With Company Receive $10 for Each Service Year

DETROIT, Nov. 4—The Packard Motor Car Co., closing its most successful year, has distributed a generous cash bonus among its employees. Workers with the company five years were awarded $50, and, for each additional year was added $10 up to and including 10 years. Ten-year men received $100. During the year, three men, Edward J. Jones, Harry Pearce, and Grant Winfield, completed 25 years of unbroken employment with Packard and to each was awarded a bonus of $250.

The bonus was paid to the veteran employees by check which was accompanied by a personal letter from President Alvan Macauley, who said:

"The past fiscal year has been a prosperous one and, as you know, in years of prosperity the company has rewarded employees who have been with us five years or more. The business of the company has continued to expand and we have 1500 more employees than we had last year. You have helped these new men to understand how we produce cars of excellent quality. You have realized how important it is to 'clean up and keep clean' and to be orderly and careful in your workmanship. You have protected your own life and that of your fellow-workmen by practicing safety first.

"I believe that the Packard organization is unique in the number of long time employees. Out of our 12,471 employees here and throughout the country, 1160 have been with the company over 10 years, and 2369 have been with the company five years or longer. This surely is proof of a condition of harmonious relations that is not to be found elsewhere."

Reorganize Tractor Firm

CLINTONVILLE, WIS., Nov. 6—A group of original stockholders in the defunct Topp-Stewart Tractor Co., Clintonville, Wis., have acquired all of the assets at public auction and have incorporated a new concern under Wisconsin laws bearing the same title and having an authorized initial capitalization of $75,000.

Cleveland Payrolls Lower

CLEVELAND, Nov. 6—Manufacturers in the automotive industry here cut their payrolls 16.8 per cent during October according to the employment managers' group of the Chamber of Commerce. During the same period three makers of cars or parts increased their payrolls. Men were laid off in the non-ferrous metal and electrical plants, and other industries.

OAKLAND DEALERS INCREASED TO 2364

PONTIAC, Nov. 6—Coincident with the large increase in sales and production in the year to date, Oakland Motor Car Co. announces that it has doubled its dealer organization. At the first of the year there were 1127 dealers while today they number 2364. A year ago last January the dealers numbered only 597 but this figure, it is said, represented the dealer organization after it had been reduced and before the drive was made for new dealers.

Fuel Station Gain Laid to High Prices

MILWAUKEE, Nov. 6—Building of too many gasoline service stations is one of two causes of "high prices and profits" in the sale of motor fuel during the past summer, according to a statement by the Wisconsin Department of Markets. The "inequality of competitors" is given as the other cause.

"Oil companies in Wisconsin have had an average gross margin in gasoline of 5 cents per gallon during the touring season and more than 6 cents in recent weeks, whereas a margin of 4 cents is generally conceded by oil men to be large enough," says the statement. "After the reduction of 1 cent on Oct. 26, the spread between the cost in tank cars and the selling price in tank wagons was more than 5½ cents. . . . . Gasoline consumption has increased only 2½ times since 1921, while the number of service stations has increased 5½ times. In the last two years the number of filling stations has increased 100 per cent, while gasoline consumption increased only 33 per cent. This excess building program results from excess profits. . . . The oil jobbers are trying to lift themselves by their own bootstraps and during 1926 they have pretty well succeeded. The cost of this feat to the consuming public of Wisconsin is, we believe, conservatively estimated at 1½ cents a gallon, or $3,750,000 a year.

Miller Makes New Marks

PARIS, Oct. 26 (*by mail*)—Driving his 122 in. straight-eight Miller on Montlhery track, near Paris, E. A. D. Eldridge this week broke world's records for 5 miles, 10 kilometers and 50 kilometers. The first two were his own records, while the third was taken from the late Leon Breton, on a Panhard & Levassor. Eldridge's marks are as follows: 5 miles flying start in 2 min. 8 1/5 sec., average 140.6 miles; 10 kilometers in 2 min. 39 45/100 sec., average 140.2 miles; 50 kilometers in 14 min. 12 74/100 sec., average 131.1 miles. These performances will be put up for official recognition as world's records in free-for-all class.

Millespaugh & Irish Take Detroit Plant

Will Assemble Taxicab Bodies and Build Partitions for Dodge Brothers Chassis

DETROIT, Nov. 6—Plans have been completed by the Millespaugh & Irish Corp., of Indianapolis, builders of taxicab and custom-built closed car bodies, to open an assembly plant in Detroit. The large Conant road plant formerly occupied by Graham Brothers has been secured, and the plant will be in full operation within 10 days.

Announcement of the new plant was made by Harry B. Millespaugh, president of the corporation, after an extended conference with executives of Dodge Brothers, Inc. For some time the company has been manufacturing its well known "Shamrock" taxicab bodies for use on Dodge Brothers taxicabs and the opening of the Detroit assembly plant was made necessary by the large volume of taxicab business.

Besides assembling the "Shamrock" bodies, the Detroit plant will also manufacture the well-known taxicab partitions such as are now used for converting one type of Dodge Brothers sedan for taxi service. Special bodies will be built on order and all painting of bodies will be completed in the plant. This work was formerly all done in Indianapolis where Millespaugh & Irish operate two large plants.

Millespaugh & Irish, before concentrating the major portion of their output on taxicab bodies, built closed bodies for Duesenberg, Lexington, Moon, Anderson, MacFarlane and other well-known cars. Officers of the corporation besides Mr. Millespaugh are Clarence B. Irish, vice-president and general manager, and Allan S. Beckett, secretary-treasurer.

Bond Men Hear Jordan

MILWAUKEE, Nov. 6—A most hopeful outlook for business, and commercial progress along a more even curve than ever before was outlined to members of the Milwaukee Bond Men's Club by Edward S. Jordan, president of the Jordan Motor Car Co., at the November dinner meeting. Mr. Jordan pointed out that manufacturers have learned to regulate their production in accordance with demand, and the example was first set by the passenger car industry.

Elwood J. Junkin

TROY, OHIO, Nov. 6—Elwood J. Junkin, 69, president and secretary of the Advance Aircraft Co. died here this week of heart disease from which he had long been a sufferer. Mr. Junkin came to Troy from Cleveland four years ago and organized the aircraft company which is now one of the leading producers of commercial airplanes in the United States.

Pittsburgh Plate Shows New Glass

MILWAUKEE, Nov. 6—Two new products of the Pittsburgh Plate Glass Co. which are of especial interest to the automotive industries were explained and demonstrated to the fifty-seven branch managers and other sales representatives at the annual sales conference on 1927 business held at the Milwaukee general offices, maintained with the extensive paint and varnish works in this city.

One is a lacquer recently perfected and now in quantity production which, it is claimed, will last the lifetime of an automobile. Another Pittsburgh product that will form the basis of an intensive selling campaign henceforth is a commercial plate glass one-eighth of an inch thick.

The sales staff was told by Pittsburgh experts that non-shatterable glass will be in common use before long. As yet the cost of manufacture is higher than ordinary commercial use permits, although its use in motor cars is becoming general.

Sentiment among branch managers was that present conditions will continue during the coming year. Despite the adverse effect of the enormous cotton crop and low price, southern representatives do not view the situation as serious. A hopeful development is the perfection of machines to pick the cotton crop mechanically, these having been improved to such an extent that general use on the 1927 crop is now assured.

To Form N.S.P.A. Division

CHICAGO, Nov. 6—First steps toward the organization of a Chicago regional division of the National Standard Parts Association were taken at a meeting held at the Hotel Sherman last night. C. M. Burgess of Burgess Norton Mfg. Co. was elected temporary chairman and committees on by-laws, resolutions and nominations were appointed. The next meeting will be held at Hotel Sherman, Nov. 15, at which time it is expected a permanent organization will be formed.

Coming Feature Issues of Chilton Class Journal Publications

Dec. 10—Operation and Maintenance—Service Station Equipment Issue

Dec. 15—Commercial Car Journal—Good Roads Issue

Jan. 1—Automobile Trade Journal. Annual Show Issue

Jan. 6—Motor Age. Annual Show Issue

Jan. 15—Commercial Car Journal—New York Show Issue

Jan. 27.—Motor Age—Chicago Show Issue.

Expand Janesville Plants

JANESVILLE, WIS., Nov. 6—The Janesville (Wis.) Chevrolet and Fisher body plants are on a schedule of 386 cars per working day for November, the October output having reached a few units over 10,000. Additions to both factories costing between $400,000 and $500,000 are being rushed to completion and are expected to be ready late in December, providing a capacity of more than 500 cars a day, with further increases possible by early spring.

Exclusive Bus Show Success in Illinois

SPRINGFIELD, ILL., Nov. 6—Success of the second annual motor bus show, the only exclusive bus show in the United States, was so pronounced this week that plans have been made to enlarge its scope to include five states at the spring showing which will be held here, probably next May. Indiana, Iowa, Illinois and Missouri with Wisconsin probably included, will cooperate in the event, Chester G. Moore, executive vice-president and regional director of the American Automobile Association announced.

H. G. Wright, of DeKalb, president of the Illinois Motor Transportation Association, presided at the two-day session and Sidney Gorham of the A. A. A. board of directors detailed the work and program of the organization. Election of officers and other business matters will be transacted at the annual meeting in this city Jan. 17.

Motor bus manufacturers and makers of accessories were exhibitors at the big show in the Armory. Senator Wright, president of the State association, is president of the Northern Illinois Public Service Co. H. E. Barber, Marion, president of the Egyptian Transportation System, is vice-president and Chester G. Moore, Joliet, secretary of the Joliet, Plainfield & Aurora Transportation Co. is secretary.

Chicago Votes Wider Roads

CHICAGO, Nov. 6—Cook County, including the City of Chicago, voted a $15,000,000 bond issue in Tuesday's election for the purpose of widening the highways leading into Chicago and building new 40 ft. highways. Work will be started immediately.

Calendar of Coming Events

SHOWS

Brussels .....Dec. 4-15

Buenos Aires .....Dec. 7-20
Ninth Argentine Automobile Show, Palermo Park.

Cairo .....Feb. 15-March 15
First International Motor Show.

Chicago .....Nov. 15-19
Hotel Sherman, National Standard Parts Association.

Chicago .....Jan. 10-15
Coliseum, American Road Builders' Association.

Chicago .....Jan. 29-Feb. 5
National, Coliseum, National Automobile Chamber of Commerce.

Chicago .....Jan. 29-Feb. 5
Annual Salon, Hotel Drake.

Los Angeles .....Feb. 12-19
Annual Salon, Hotel Biltmore.

New York .....Nov. 28-Dec. 4
Annual Salon, Hotel Commodore.

New York .....Jan. 8-15
National, Grand Central Palace, National Automobile Chamber of Commerce.

Paris .....Dec. 3-19
International Aeronautic Exposition, Grand Palais.

Ponce, Porto Rico .....Dec. 1-12

CONVENTIONS

American Road Builders' Association, Congress Hotel, Chicago....Jan. 10-15

American Welding Society, Broadway Auditorium, Buffalo .....Nov. 17-19

Associated Manufacturers of Fabric Auto Equipment, Inc., La Salle Hotel, Chicago .....Nov. 13

Motor & Accessory Manufacturers Association, Dinner, New York .Jan. 12

National Association of Finance Companies, Palmer House, Chicago .....Nov. 15-16

National Automobile Dealers Association, Hotel Commodore, New York .....Jan. 10-11

National Automobile Dealers Association, La Salle Hotel. Chicago..Feb. 1-3

National Standard Parts Association, Hotel Sherman, Chicago....Nov. 15-19

National Tire Dealers Association, Inc., Memphis, Tenn. .....Nov. 16-18

N. A. C. C.

Chicago, Feb. 1—Service Meeting.
New York, Jan. 10-11—Third World Motor Transport Congress.
New York, Jan. 11—Service Meeting.
New York, Jan. 11—Banquet.

S. A. E.

Boston, Nov. 16-18—Transportation and Service Meeting.
Cleveland Section, Nov. 29—The Engineer, the Trade and the Owner—David Beecroft.
Detroit, Jan. 25-28—Annual Meeting.
Detroit, Jan. 28—Carnival.
Metropolitan Section, Nov. 15.—Engines—W. A. Frederick
New York, Jan. 13—Banquet.

RACES

Altoona, Pa. .....June 11
Atlantic City .....April 30
Charlotte, N. C. .....May 9
Fresno, Cal. .....April 21
Indianapolis .....May 30
Los Angeles .....Nov. 28
Los Angeles .....Feb. 22
Los Angeles .....April 10
Salem, N. H. .....June 25